APRIL 28, 1958

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

Let's Leap to Recovery with . . .

Bold Action on Depreciation

—Page 55

✔ Saved: $22,000 Yearly in Machining Costs . . . Page 98

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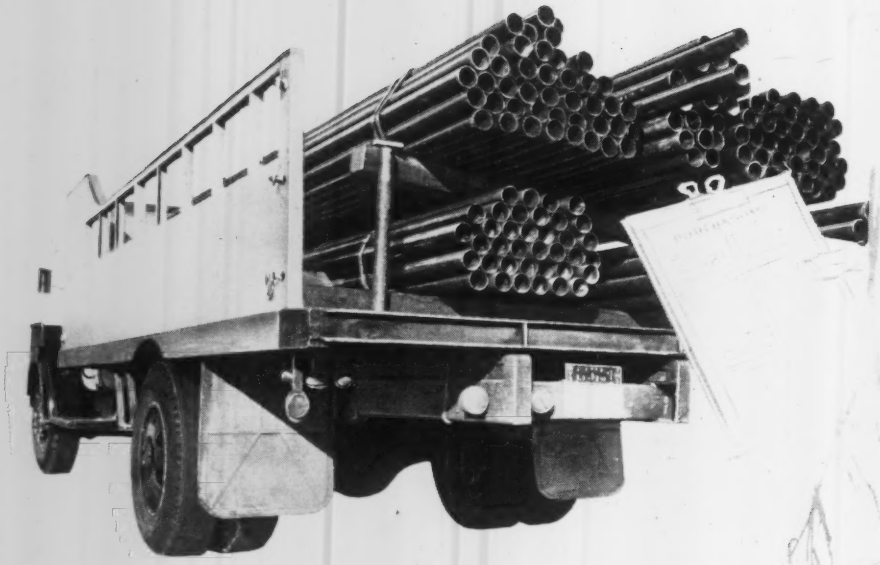


B&W distributors offer you local delivery when you need tubing fast

Wherever your plant is located, there's a handy, nearby source of high-quality B&W tubing. You'll find a B&W sales office in all major cities—and distributors handling B&W Tubular Products are located from coast to coast. It means fast service and *dependable* delivery of the tubing you need, when you need it.

And B&W offers an unusually large selection to choose from. There is a complete range of tubing sizes, grades, finishes and analyses ready for delivery. In stainless, carbon, and high-alloy steels. In seamless or welded, pressure or mechanical tubing. You will find too a convenient local distributor of B&W welding fittings, flanges and small diameter pipe.

B&W's nation-wide network of district sales offices stands ready to assist your distributor *and you* in finding the right tubular product for your special application. The Babcock & Wilcox Company, Tubular Products Division, Beaver Falls, Pa.

AMERICAN STEEL WAREHOUSE ASS'N

B&W

TUBULAR PRODUCTS DIVISION

TA-8031-G4

Seamless and welded tubular products, solid extrusions, seamless welding fittings and forged steel flanges—in carbon, alloy and stainless steels and special metals.

XXVIII

This is the twenty-eighth of a series of advertisements dealing with basic facts about alloy steels. Though much of the information is elementary, we believe it will be of interest to many in this field, including men of broad experience who may find it useful to review fundamentals from time to time.

Cold-Finishing of Alloy Steel Bars: Turning and Polishing

Continuing our discussion of the cold-finishing of alloy steel bars, we take up the subject of turning and polishing. A later discussion will cover grinding and polishing. Both require removal of surface metal. In both the turning and grinding operations, adequate allowances provide for the removal of decarburization and surface defects which sometimes occur in alloy bars.

As previously stated, the outstanding advantage of cold-drawn bars over hot-rolled bars is the *bright, smooth finish*. However, the quality of the cold-drawn finish varies with the size and amount of draft (reduction of cross-sectional area) applied in cold-drawing. For example, by using a 1/16-in. draft, a 3/4-in. round would have a better cold-drawn finish than a 3-in. round.

When a superior mirror-like finish with additional accuracy is required on surfaces that are not machined (such as on shafting or machine parts), two processes other than cold-drawing are suggested: turning and polishing, and grinding and polishing. The first of these will be discussed here.

Turning and Polishing. This method of cold-finishing is generally associated with centerless bar-turners, accommodating rounds from 1¼-in. to 6-in. diam, inclusive. The process is the reverse of conventional lathe-turning, which is normally used for larger sizes. The centerless turning equipment uses two cutter heads which contain from one to four cutting tools. The system provides for both rough and finish cuts. The bar, which is stationary, is fed horizontally into the rotary cutter heads by means of a mechanical or hydraulic feeding mechanism. Most bar-turners are equipped with a series of polishing rolls that also rotate around the bar as it feeds from the rotary cutter heads. This, combined with subsequent burnishing action from the straightening rolls, imparts a high degree of polished finish to the product. A polished surface on a turned bar can also be produced by a number of passes through the straightening rolls.

This process is applicable to normalized, annealed, or heat-treated carbon and alloy bars. It does not materially affect the mechanical properties. For this reason, the end product can be machined unsymmetrically, with little or no tendency to warp.

Bethlehem metallurgists will gladly work out any problem in the cold-finishing of alloy steel bars. Always feel free to ask for their services.

When you are in need of steels remember, too, that Bethlehem manufactures the entire range of AISI standard alloy grades, as well as special analysis steels and all carbon grades.

If you would like reprints of this series of advertisements, please write to us, addressing your request to Publications Department, Bethlehem Steel Company, Bethlehem, Pa. The subjects in the series are now available in a handy 40-page booklet, and we shall be glad to send you a free copy.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

ALL CYLINDER COMPONENTS are structurally designed to withstand a shock impact load equivalent to a 3G landing of the aircraft. Stroke of the bed raising cylinders is 152½ inches; trunnion to pin eye centers, 179 inches extended—26½ inches closed. Cylinder inside diameters range from 14 inches in the mains to 5¾ inches in the smallest sleeves.

Hydraulic high-stretch from short closed position

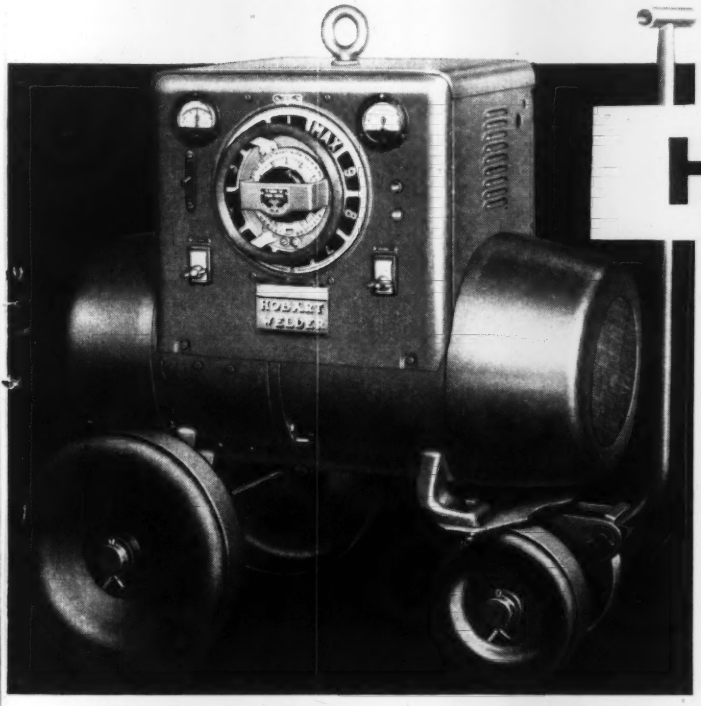
THIS 9000 lb. vertical "landing field" and the aircraft riding piggy back are hydraulically positioned in just 3½ minutes by the two large COMMERCIAL six-stage telescopic cylinders. They stretch out over 10½ feet in playing a key role in the successful takeoff and landing of the U. S. Air Force Ryan X-13 Vertijet. In returning from vertical to horizontal position a double acting control in these cylinders enables the bed to be pulled over the center of gravity. Special features built into the first and sixth stages set up this unique operation. Once past the center of gravity, the cylinders return to their closed position by the weight of the bed and aircraft.

Here was another application problem that COMMERCIAL'S versatility in fluid power engineering helped to solve. If you have a fluid power problem involving pumps, valves, motors or cylinders, perhaps we can come up with the solution quickly and economically. Address inquiries to The Commercial Shearing and Stamping Company, Dept. L-18, Youngstown 1, Ohio.

CABLE ARM operating and cable tensioning cylinders, trailer outrigger jacks and two sizes of pumps to generate the fluid power for the hydraulic system were also furnished by COMMERCIAL.

COMMERCIAL
shearing and stamping

You'll like the extra advantages you get with the NEW



HOBART

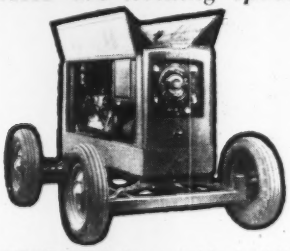
ARC WELDERS

The extra "built-in features" of Hobart brings a new speed in fabrication that will lower your welding costs. There's more actual net profit in welding jobs when you can select a size and type welder best suited for your particular work.

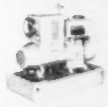
Hobart has a wide selection of welders to choose from in AC or DC or AC/DC combinations —automatic and semi-automatic for inert gas and submerged arc welding. You pay no more for Hobart's extra advantages, high operating efficiency and long life construction.

It will pay you to get a copy of the new "full line" catalogue that describes all the latest models, no obligation.

HOBART arc welding speeds up PRODUCTION, MAINTENANCE, CONSTRUCTION and REPAIR



GAS ENGINE DRIVE for outside building, repair and equipment maintenance in 250 to 600 ampere capacity, air cooled or water cooled.

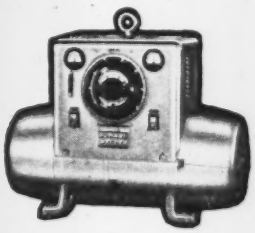


"Husky Boy"

AC Welder/AC Power

"Big Brother"

Weldmobile

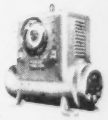


ELECTRIC MOTOR DRIVE for production and maintenance welding in 200 to 600 ampere capacity, with remote control on all standard models.

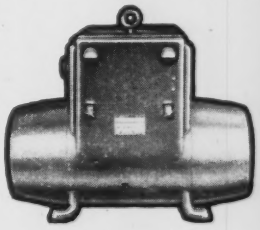
◀ *AC Transformer*

AC/DC ▶ *Combination*

DC Rectifier

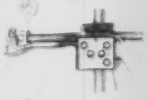


"Bantam Champ"



"POWROMATIC" constant voltage DC welder with simplified controls for automatic arc welding at its best.

Automatic Welding Head



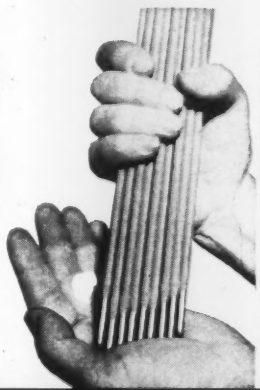
Automatic-Inert Gas

Handomatic

Migarc

HOBART *manufacturers of the world's most complete line of arc welding equipment*

Try these new **HOBART "ROCKET 24"** *high speed iron powder electrodes—gives an exceptionally smooth arc action and reduces the possibility of undercutting. Ask for FREE electrode catalog.*



HOBART BROTHERS CO., BOX ST-48, TROY, OHIO

HOBART BROTHERS CO., BOX ST-48, TROY, OHIO, U.S.A.

Send information, delivery, and prices on

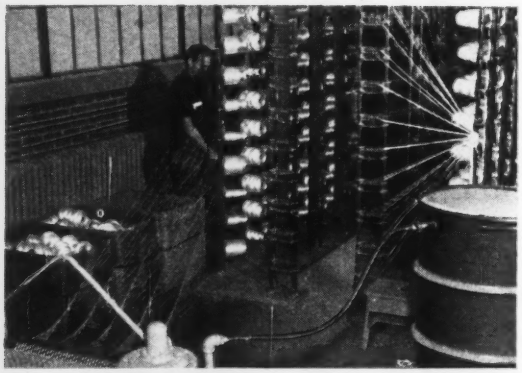
_____*Amp. capacity* ☐ *Gas Drive* ☐ *Electric Drive* ☐ *"Husky Boy"*
☐ *AC Transformer* ☐ *AC/DC Combination* ☐ *DC Rectifier*
☐ *Automatic Welders* ☐ *"Rocket 14" Electrodes*

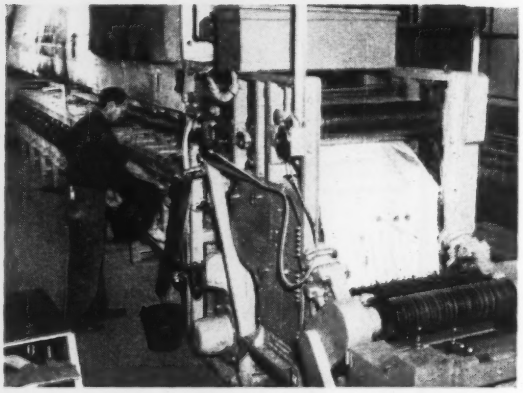
*name*_____

*address*_____

*city*_____ *zone*_____ *state*_____

How V-Belts with the Green Seal save you money





Moneysaving performance is built into every Goodyear V-Belt in exclusive manufacturing processes like those illustrated above. Synthetic fiber cords are impregnated repeatedly with special rubber latex compounds. When treated at a precise tension and temperature for a precise time (the exclusive 3-T process), the cords are stabilized at the point of greatest strength before being built into the load-carrying section of Goodyear V-Belts.

They're dimensionally stable — Exclusive 3-T Cords or unsurpassed steel cables muscle belts that don't shrink or stretch in storage. So matched sets *stay* matched. Down time is cut to a new low.

They're precisely measured — The length you need is the length you get. Mismatching failures are minimized.

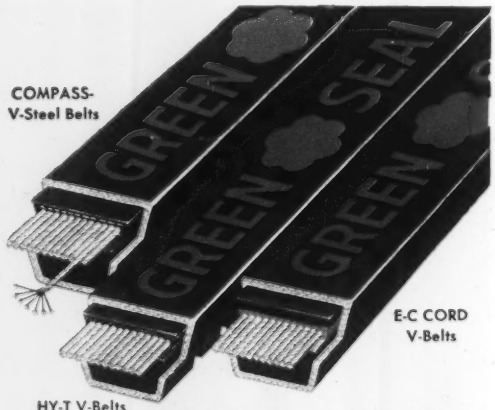
They're high in modulus, low in stretch — Power loss through "creep" is virtually eliminated. Take-ups are few and far between.

They're friction-balanced, non-dusting — Their covers don't grab or stick in the grooves. They run smoothly and cleanly.

They're mildew-inhibited — They're safely stored and operated in high moisture. Stand-by drives always ready when needed.

—AND IT ALL ADDS UP TO

—Maximum trouble-free horsepower hours at minimum cost. It's reason aplenty that you should use only V-Belts with the Green Seal. See your Goodyear Distributor for details. Or write Goodyear, Industrial Products Division, Lincoln 2, Nebraska, or Akron 16, Ohio.



Note: Constructions shown apply only to belts up to 112" in length

DIMENSIONALLY STABLE V-BELTS with the GREEN SEAL by

GOODYEAR 60th GOODYEAR ANNIVERSARY

THE GREATEST NAME IN RUBBER

Compass, E-C Cord, Hy-T, Green Seal—T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

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April 28, 1958
Vol. 142 No. 17

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STEEL, the metalworking weekly, is selectively distributed without charge to qualified management personnel with administrative, production, engineering, or purchasing functions in U. S. metalworking plants employing 20 or more. Those unable to qualify, or those wishing home delivered copies, may purchase copies at these rates: U. S. and possessions and Canada, $10 a year; all other countries, $20 a year; single copies, 50 cents. Metalworking Yearbook issue, $2. Published every Monday and copyright 1958 by Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio. Accepted as controlled circulation publication at Cleveland, Ohio.

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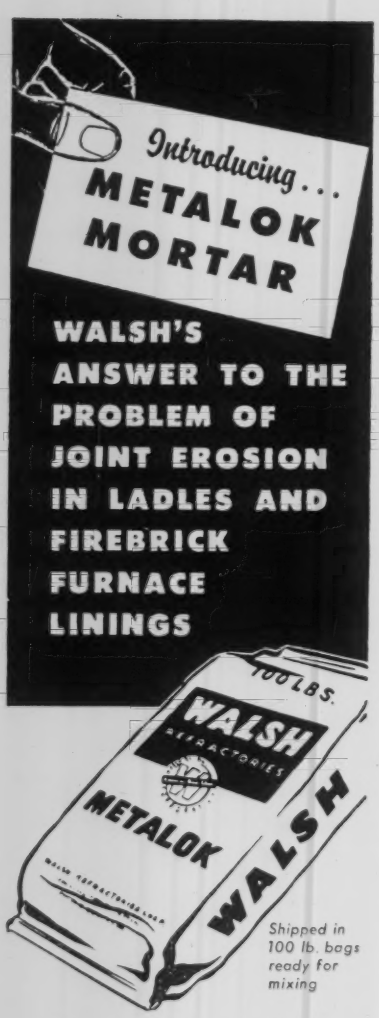


Shipped in 100 lb. bags ready for mixing

Used in laying up Walsh Ladle brick, Metalok successfully retards penetration of metal and slag... reduces joint erosion to the barest minimum — definitely increases ladle lining life.

For greater satisfaction and improved service in slab, reheat and other metallurgical furnaces, get acquainted with new Metalok. A trial will convince you. Write today for the complete money-saving story.

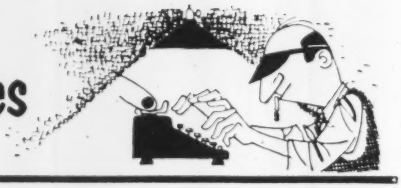
Specialists in Refractories of High Bulk Density and Low Porosity

WALSH REFRACTORIES CORPORATION

101 FERRY ST. • ST. LOUIS 7, MO.

FOR OVER 60 YEARS MANUFACTURERS OF HIGH GRADE REFRACTORIES

behind the scenes



Depreciation Problem

Cartoonists and dramatists frequently get their points across by using the shock treatment; they can take any truism, and by presenting it in an unnecessarily harsh manner, make it shockingly clear. Let us borrow their tricks to illustrate the problems of depreciation, and thus condition you for the article that appears on Page 56. (STEEL's Plan for Depreciation, by Associate Managing Editor John Morgan.)

You never did accept the Fourteenth Amendment, so you own five slaves. When you bought them they were worth $1000 each. Each year they declined in value, due to wear and tear, continual use, exhaustion, impairment, and obsolescence. Being a shrewd and reasonable Christian gentleman, you figured your slaves depreciated in value each year, so you applied this loss to your income tax deductions. You want to write them off in 20 years and buy new ones—but the government tells you it's no dice: Write 'em off in 40 years, Jack. Moreover, when you investigate the new models, behold, they have gone up in price. Prime slaves are now $1500, and you can't take a loss on them until the old ones are used up, according to government figuring. Your ideas and the government's ideas on obsolescence and depreciation don't jibe, so you have several choices: Forge some papers showing that the slaves cost originally $5000 each, so deductions over a long term will amount to something respectable; amortize the property over a long term and keep yourself broke so you can't buy feed and seed; refuse to pay on government terms and go to jail; free the slaves and go out of business.

STEEL's Depreciation Plan, if put into effect, would contribute significantly toward ending the recession and halting inflation. Let us know what you think of it.

Open the Door, Richard

Did you observe yesterday properly? It was National Mother-in-Law Day, and we are chagrined to confess that we forgot all about it. Mother-in-law jokes go back to Egypt; anecdotes and comments about them have been found scribbled on tombs from Memphis to Ur. Ur, of course, isn't in Egypt, but it is in practically every crossword puzzle ever printed, and if it's good enough for Abraham, we shouldn't complain about it. Come to think of it, Abraham must have had a mother-in-law—possibly a whole mess of them. How do you celebrate a mother-in-law day? Next year will be upon us before you know it, and you won't want to be caught flat-footed, will you? Years ago a friend of ours tried a novel approach. He invited the old bat (oops!) to move in with them. After she was settled, he excused himself. "Gotta run over and see Richard," he murmured. Just the other day a short-wave ham revealed that Richard was an Eskimo living in King William Land.

For Iron Stomachs

The 41st Annual Conference of the National Open Hearth Steel Committee, AIME, gathered to feed itself at the Statler Hotel in Cleveland on Tuesday evening, Apr. 15. This act in itself was of no great moment: Committee members are notorious eaters. The thing that marked the NOHC was its printed program, a diecut folder resembling an ingot. The menu read:

CHARGING SCHEDULE

Celery Seconds
Low Sulph Radishes
Periclase Olives

*

Fruit Cocktail Atomizer

*

Mushroom Soup a la Taconite

*

Bifurcated Prime Ribs of Beef
Roof String Beans No. 2 Bundle Potatoes

*

Bath Immersion Salad
with
Group 3 Ore Dressing

*

Skulled Alaska

*

Java Dead Burnt Buns

When the committee was fully charged, Charles M. White, chairman, Republic Steel Corp., delivered an address entitled "The Great Delusions." We hope somebody will be kind enough to send us a copy of that talk, mostly on account of it's always a pleasure to listen to a man who knows what he's talking about.

Tootski! Tootski!

Nobody came up with the exact figure calculated by the Vassar girl. She said the correct amount payable for Pappy's hooch was $29.25, and if you wish to quarrel with a Vassar girl's figure, that's your affair. But enough; synchronize your watches, and let's be off. At 1 o'clock a train leaves the Russian city of Klootchiev at 30 mph in a direction due East, while another train leaves the same station heading N 20° W at 40 mph. At the end of 2 hours, how far apart are the trains?

Shrdlu

(Metalworking Outlook—Page 49)

New CINCINNATI
flamatic®

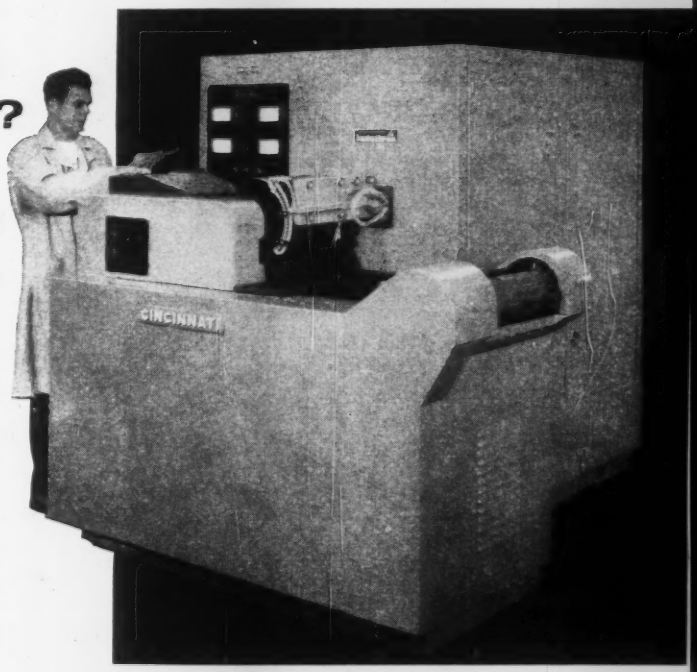
In production, the machine shown uses multiple fixtures for selective surface hardening *1000 automotive rocker arms per hour.*

which

CINCINNATI

meets your selective surface hardening needs?

Your product components that require heat processing—such as selective surface hardening, annealing, brazing, tempering—can be Cincinnati-processed at a savings! New and versatile Cincinnati flame or induction heating machines can do the work you specify—and meet your cost-per-piece requirements-on high production quantities or varied, small-lot runs. Let a Process Machinery Division field engineer evaluate your needs. With the assistance of our extensive research laboratories and engineering facilities, he is ideally equipped to recommend the heat source and method that will be best and cheapest for you.



See these two machines in operation, ASTE Show, Booth No. 1555, Philadelphia Convention Center, May 1 through 8.

New CINCINNATI
inductron®

This machine induction hardens both ends of *automotive push rods at the rate of 3600 parts per hour.*

CINCINNATI

flamatic and inductron
hardening machines

Meta-Dynamics Division
THE CINCINNATI MILLING MACHINE CO.
CINCINNATI 9, OHIO, U. S. A.

YOLOY "E" IS ON THE JOB

. . . giving greater strength and corrosion-resistance to salt mine cars

These special mine cars operate 1100 feet below ground where repairs and replacements are costly and difficult. Yoloy "E" was chosen for the bodies of these cars because The International Salt Company needs rugged equipment. Equipment that will resist severe corrosion; equipment that is strong and durable but light in weight.

Yoloy "E" steel meets these exacting specifications. Yoloy "E" has a high strength to weight ratio, superior resistance to corrosion, high resistance to shock and fatigue failure, and is easy to weld and fabricate.

Youngstown's complete family of Yoloy steels is available in sheets, plates, bars, shapes, Cold Drawn Bars, and Tubular products. Data sheets on each of the Yoloy family of steels will be sent upon request.

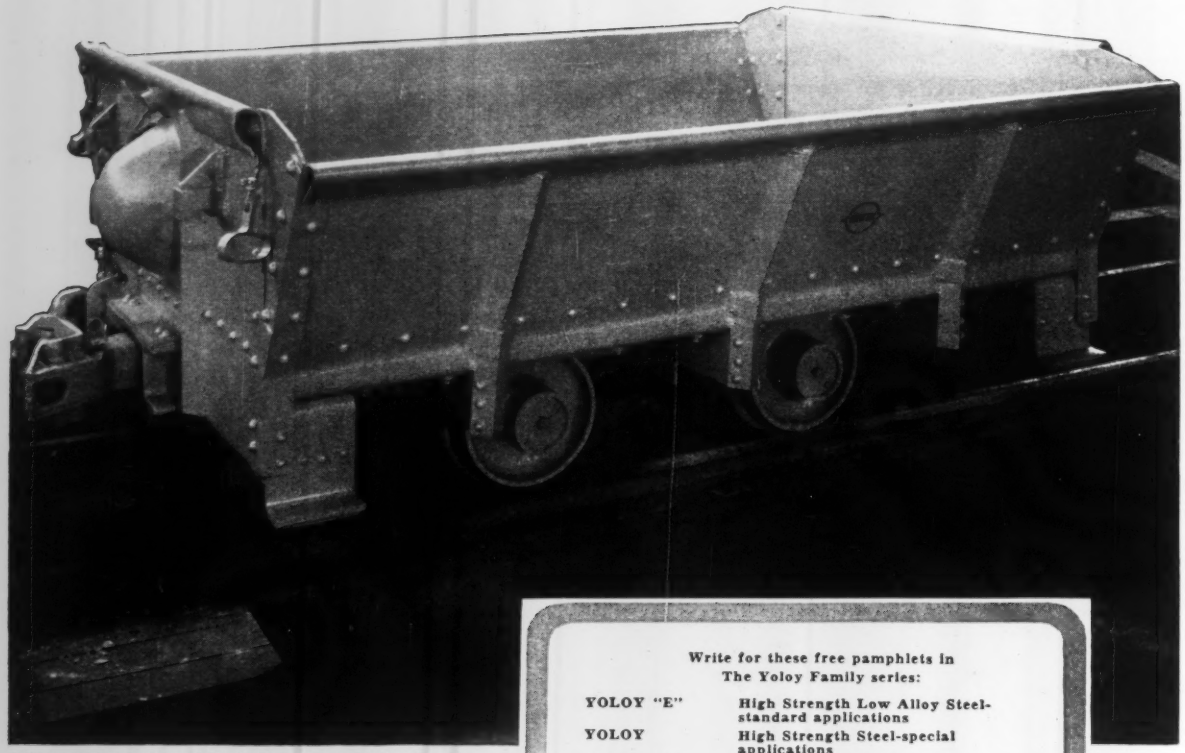
QUALITY YOUNGSTOWN SERVICE

Producers of Carbon, Alloy and Yoloy Steels

THE YOUNGSTOWN SHEET AND TUBE COMPANY

General Offices - Youngstown 1, Ohio

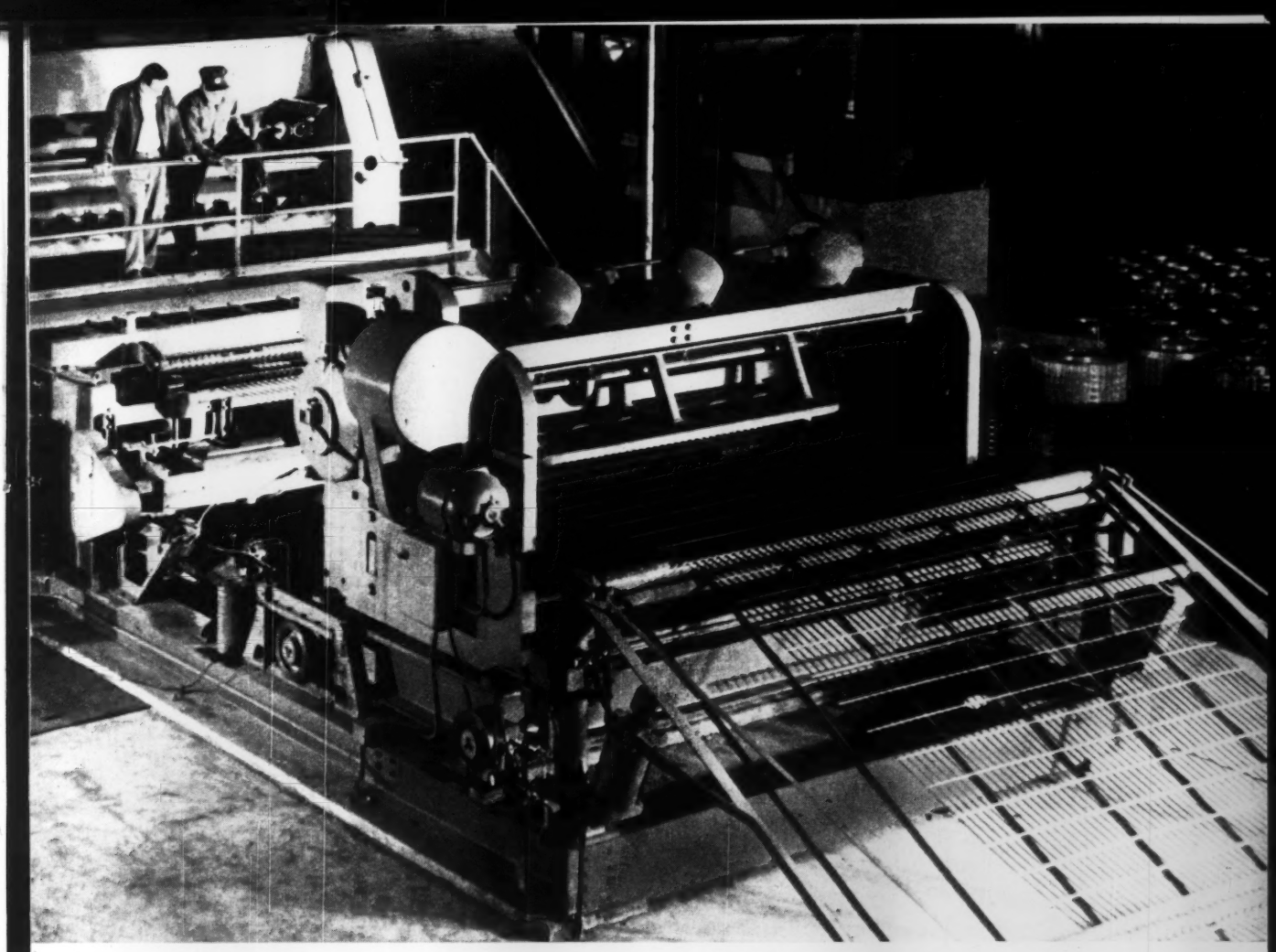
District Sales Offices in Principal Cities



Photograph courtesy of Irwin Foundry and Mine Car Co.

Write for these free pamphlets in The Yoloy Family series:

YOLOY "E"	High Strength Low Alloy Steel-standard applications
YOLOY	High Strength Steel-special applications
YOLOY "S"	Higher Strength Steel for increased service life
YOLOY "C"	Corrosion Resistant Grade for deep forming
YOLOY PIPE	Continuous Weld for corrosion resistant applications



Cincinnati Shear cuts wire mesh at Pittsburgh Steel

The Cincinnati Shear shown is part of an automatic wire welding machine at Pittsburgh Steel Company, Monessen, Pennsylvania. The machine produces wire mesh and fabric used for concrete pipe, buildings, and other applications. The photograph shows the shear cutting forty-seven 2/0 gauge (.331″) wires per stroke. The wire is low carbon, cold drawn steel. Other jobs require shearing mesh with wires up to ½″ diameter. This shear was specially engineered for this type of application. Because cuts are heavy and production is continuous, Cincinnati dependability is essential.

Standard Cincinnati Shears offer such productive features as powerful hydraulic hold-downs, all-steel interlocked construction, and one-clearance shearing of different metal thicknesses.

Write Department C for Shear Catalog S-7R.

Shapers / Shears / Press Brakes

THE CINCINNATI SHAPER CO.

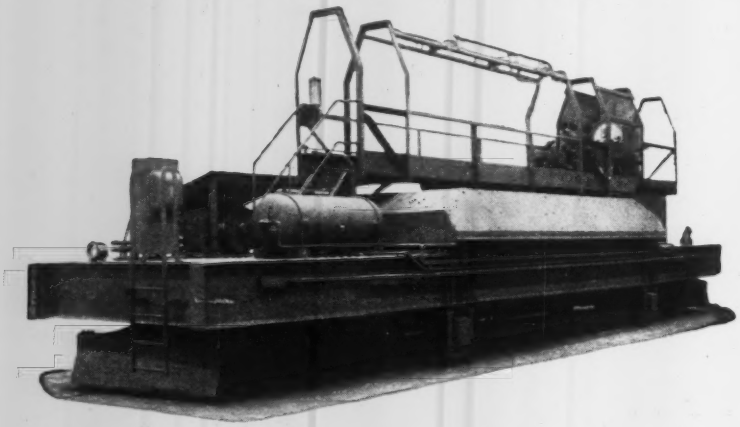
Cincinnati 11, Ohio

STOCK HOUSE OR HIGH LINE

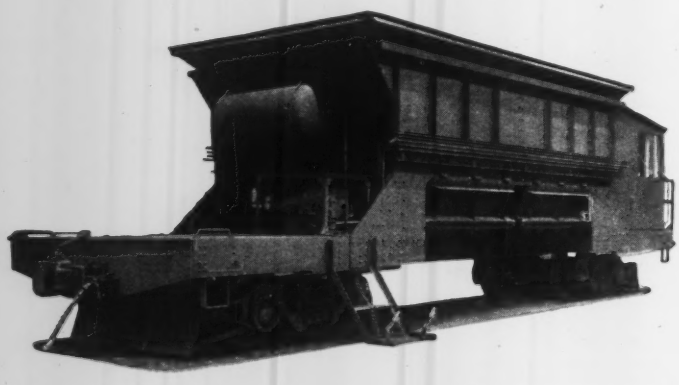
operators prefer the

DEPENDABILITY OF ATLAS CARS

These specially designed units are another example of the ruggedness of Atlas Cars. Their dependability helps maintain the most rigid furnace charging cycles.



40-TON SCALE CAR
Double Hopper Bottom Dump



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Gable Bottom Double Side Dump

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LETTERS
TO THE EDITORS

Editorial Refreshing to Reader

News analysts, newspapers, broadcasters, and others have done a masterful job spreading gloom. It is refreshing to come across an article such as the editorial, "Take Lid Off Spending," in your Mar. 24 issue (Page 59).

If these high-level analysts were so adept at figures, it would seem they might have made the simple deduction that "selling the national economy short" through their powerful weapon might boomerang to the point where they, too, would feel its effects.

Your article might have been even more appropriate on the front cover.

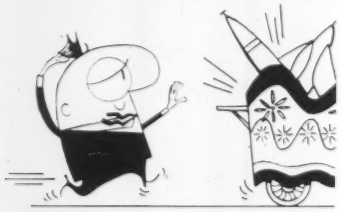
C. N. Brubaker
Vice President
Browning Mfg. Co.
Maysville, Ky.

Pinpoints Solution to Problem

Your article, "Deburring with Ultrasound" (Apr. 7, Page 102), is both timely and pointed. It pinpoints a solution to a long time problem in every machining plant.

S. Gesser
Kaybe Mfg. Co.
Brooklyn, N. Y.

Getting on Defense Bandwagon



Your third installment of the 1958 Program for Management, "Managing Defense Work for Profit" (Apr. 14, Page 125), is an excellent example of the thoroughness of the articles in each issue of STEEL. Due to the increasing importance of government work, it is a timely article for all industry.

John A. Casey
Market Analyst, Bearing Div.
McGill Mfg. Co. Inc.
Valparaiso, Ind.

Good Machinery Description

Let me join with Ralph Billingham in thanking you for the excellent coverage of the heavy machinery which business publication editors witnessed at our plant. Your article, "Family of Specials Tackles Short Runs" (Mar. 17, Page 96), has gone to the heart of the situation.

The use of custom-built equipment incorporating mechanical handling, hydraulic positioning, and automatic electrical pushbutton control is our answer to any major production shop on "How To Beat

(Please turn to Page 12)

LOOK AGAIN AT COSTS

No bones about it, grinding problems *can* pile up! But there's a quick answer! Switch to CINCINNATI (PD)° WHEELS. For now Cincinnati Grinding Wheels offer POSITIVE DUPLICATION—a remarkable achievement in precision manufacturing and quality control that can *save you money . . . and increase your production.*

Through the Cincinnati (PD) manufacturing process, you are assured POSITIVE DUPLICATION of the original wheel every time you reorder. "On Grade" with a CINCINNATI (PD) WHEEL means all future (PD) wheels will perform and grind exactly alike.

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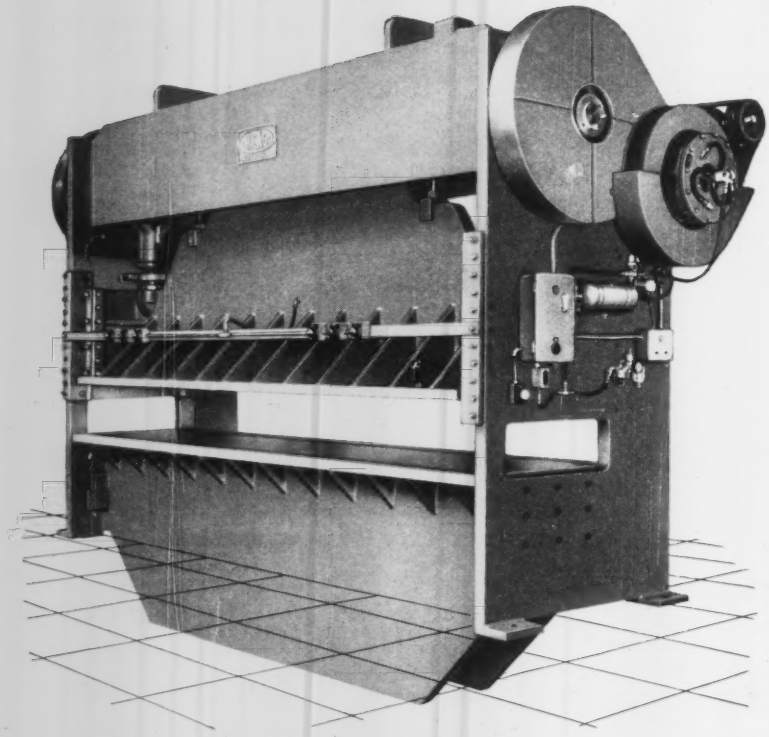

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large die area
capacities up to 400 tons

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LETTERS

(Concluded from Page 10)

the Cost Crisis."

Again, congratulations for the straightforward approach that your organization has always taken toward the position of machine tools in the American economy.

K. L. Finkenstaedt
Executive Vice President
W. F. & John Barnes Co.
Rockford, Ill.

Lauds Way To Sell Management

Congratulations on your excellent article, "How To Sell Ideas to Bosses" (Apr. 7, Page 71). This important qualification for a successful manager has been ignored too long.

W. T. Geiger
Superintendent
Hot Strip Finish & Cold Mill
Alan Wood Steel Co.
Conshohocken, Pa.

Union Drive Interests Reader

I would appreciate a copy of the interesting article, "Whitecollar Drive To Resume in '59, '60" (Mar. 24, Page 65).

Karl G. Nowak
Factory Superintendent
Fenwal Inc.
Ashland, Mass.

• • •

It contains much information. Please send a reprint.

C. E. Hollingsworth
Industrial Relations Dept.
Haynes Stellite Co.
Division of Union Carbide Corp.
Kokomo, Ind.

Article Is Well-Worded

According to comments we have heard, the article, "Licensing: A Road to Profit" (Feb. 24, Page 46), is basically sound and well-worded. Please forward a copy.

Clyde E. Yost
President
Ken Standard Corp.
Evansville, Ind.

Points Aptly Portrayed

Besides the fundamental material in your Program for Management article, "Production Control for Profits" (Mar. 17, Page 83), we found the information interestingly laid out, and the way it was presented made it easy to read. Case history material aptly portrayed the article's significant points.

F. W. Norris
Manager, Production Planning
Chemical & Metallurgical Div.
Sylvania Electric Products Inc.
Towanda, Pa.

• • •

There are several excellent ideas in this article which we are having our production people study.

George D. Watrous
Assistant to the President
Winamac Steel Products Inc.
Winamac, Ind.

NOW: Higher strength costs you less! Specify TENZALOY*, the self-aging aluminum alloy that needs no heat treatment! TENZALOY is a corrosion resistant aluminum alloy that ages at room temperatures, gives high strength properties superior to those normally obtained only by solution treating, quenching and artificial aging. And these properties are stable, proved by conclusive test data taken over a ten year period. No special foundry techniques are required. No fluxes. Castability is excellent with sand cast and plaster molds, and many permanent molds. TENZALOY will not "grow". It takes a brilliant polish and anodizes clear white. Write for TENZALOY Bulletin No. 103 or call one of Federated's 22 sales offices. Federated Metals Division, 120 Broadway, New York 5. In Canada: Federated Metals Canada, Ltd., Toronto and Montreal.

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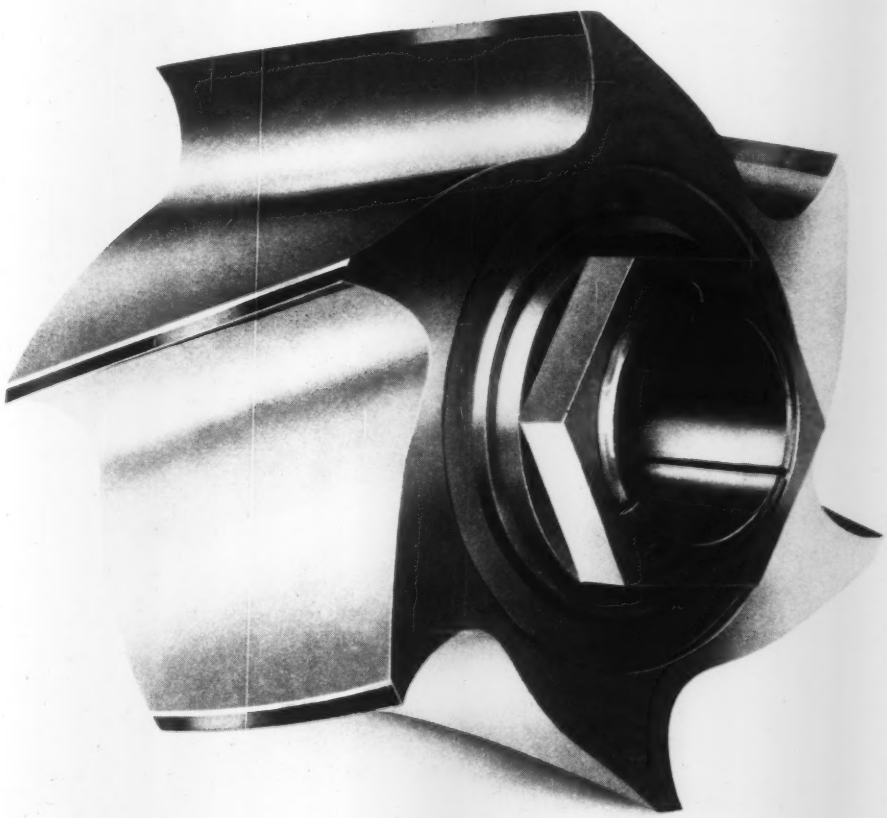

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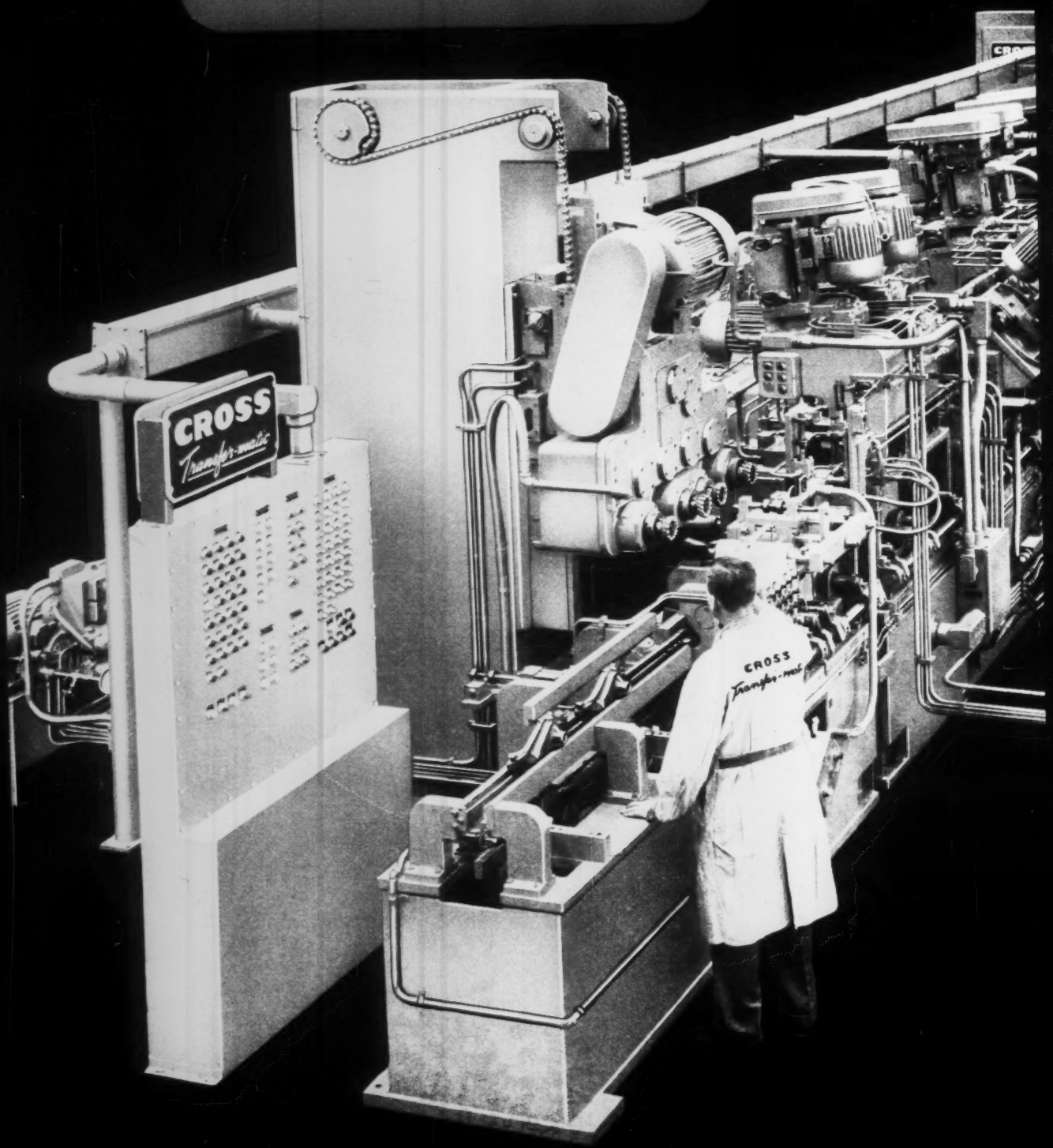
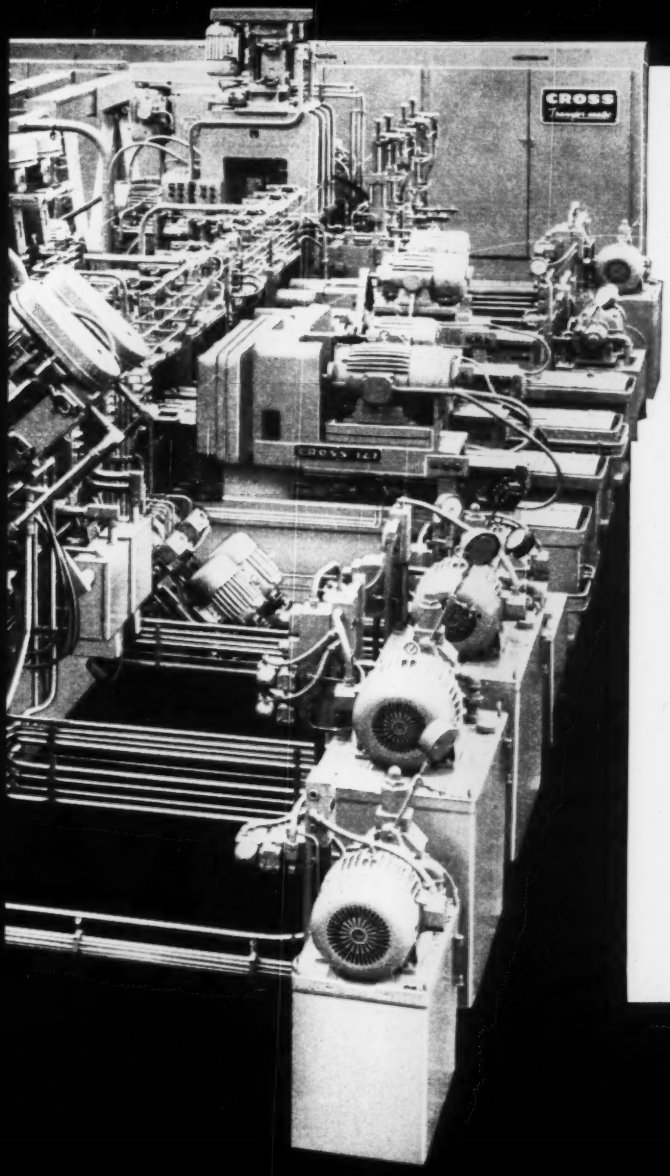
Complete Machining of Water Pump Bodies



Another Transfer-matic by Cross



- ★ Machines two castings simultaneously at rated capacity of 200 pieces per hour.
- ★ Station 1 load; Station 2 mills mounting faces; Station 3 drills thermostat by-pass hole, mainshaft hole and four mounting holes; Station 4 cross-faces cover face and drills one angular vent hole; Station 5 chamfers thermostat by-pass hole, drills six cover holes, spot-faces mainshaft hole on inside; Station 6 cross-faces impeller face, reams thermostat by-pass hole and drills second angular vent hole; Station 7 spotfaces and chamfers mainshaft hole, spotfaces four mounting holes and drills by-pass hole on inside; Station 8 finish cross-faces impeller face and recesses center of mainshaft hole; Station 9 semi-finish bores mainshaft hole; Station 10 finish precision bores mainshaft hole; Station 11 tap drills heater connection hole and probes cover holes; Station 12 taps heater connection hole and six cover holes; Station 13 automatically unloads two pump bodies.
- ★ Locating: in Station 2, parts are located from foundry pads; in Station 3, from milled faces and cored water passages; and, from Station 4 on, from milled faces and two mounting holes.
- ★ Cross' "building block" principle provides flexibility for future part design changes.
- ★ Other features include: complete interchangeability of all standard and special parts for easy maintenance, construction to JIC Standards, hardened and ground ways and automatic lubrication.

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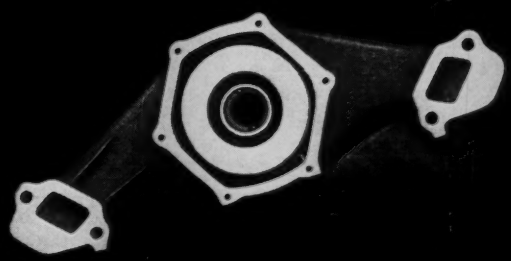

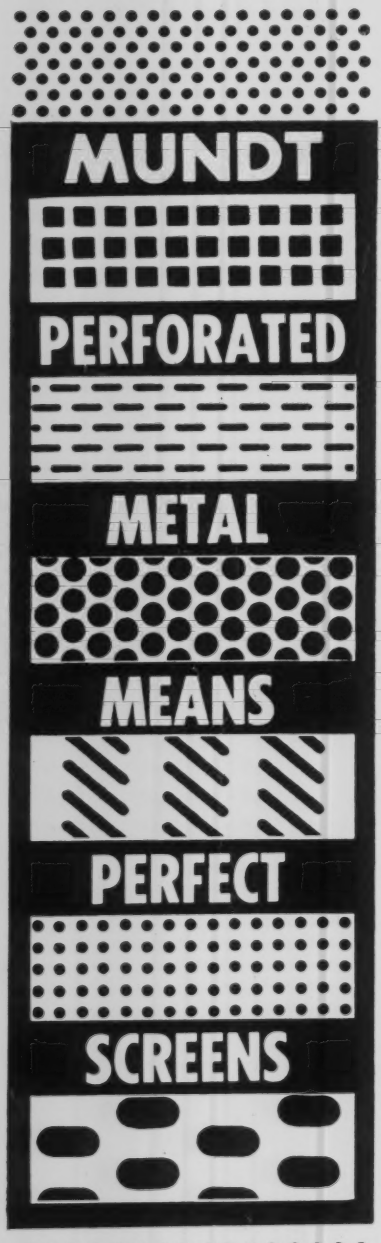

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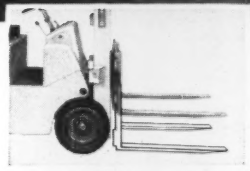

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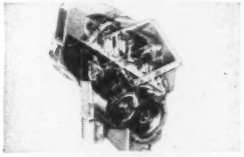

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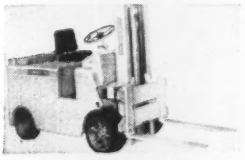

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Send for Booklet SP-23 showing how industry's most complete line of fork lift trucks will improve your plant operations and lower your production costs.

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Many people, we've found, are astounded to discover just how many different sizes of ball bearings roll off the Federal production line. 12,347 *is* a lot of ball bearing sizes—and there are hundreds of types, too. It helps explain why Federal Ball Bearings are used so extensively . . . by so many companies . . . for so many different applications. For instance: on General Electric appliances, Warner gears, International Harvester tractors, Otis escalators, Burroughs calculators, Skil saws and many, many more. Chances are, much of your manufacturing equipment performs smoothly with the aid of Federal Ball Bearings.

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TIPS FROM A ROLL MAKER'S NOTEBOOK

MACKINTOSH-HEMPHILL DIVISION, E. W. BLISS COMPANY, Pittsburgh 3, Pennsylvania

Cast mill rolls • Johnston cinder pots • rotary tube straighteners • end-thrust bearings • heavy-duty lathes • steel and special alloy castings

Tooling: key to longer roll life between redressings

Most difficult roll turning job done regularly at Mack-Hemp is dressing pipe mill rolls. Turning takes a week or more, with carbide tools reground three or four times per hour.

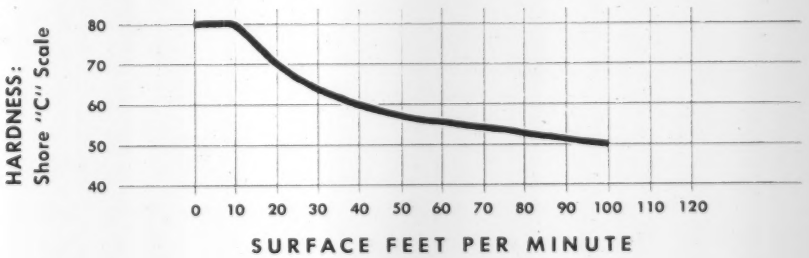
In a very important sense, block lathe turning practice sets the upper limit on the production-per-turn of every rolling mill in a plant. The reason is obvious. If the roll shop won't turn rolls whose hardness is above a certain figure, then the extra wear resistance of these harder rolls can never be brought into play.

In investigating roll shop machining techniques, we've found that many roll shop men are often not fully informed of the remarkable increases in turning speeds, feeds and depths of cut made possible by carbide tools. High speed cutting tools can dress rolls of hardness up to approximately 68 Shore (C scale), but carbide tools can cut harder rolls up to and including pipe mill rolls that are nearly 80 Shore. A set of these extremely hard rolls recently rolled 3500 miles of pipe between dressings!

Higher turning costs can pay dividends

At these higher-hardness levels, turning a large roll takes time and care; correct speeds must necessarily be selected and feeds are sometimes reduced to only a few thousandths of an inch. And even with a comparatively low rate of metal removal, the cutting tools must be reground after every few hundred surface feet. Three to four tools are worn out on every roll. *But* . . . the dividends in service life pay for the turning costs many times over.

Since Mack-Hemp specializes in rolls, roll turning and large roll contouring lathes, our experience in these three fields together with our awareness of the high tonnages available from the harder roll grades, helps us to make intelligent recommendations to our customers' best advantage. Suggestion: if you have had difficulty in the turning of hard rolls and want to explore their use in your mills, why not give us a call? Address Mackintosh-Hemphill Division, E. W. Bliss Company, 901 Bingham Street, Pittsburgh 3, Pa.



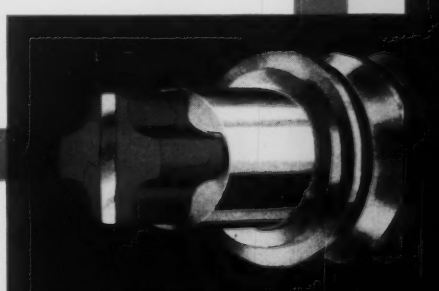
Cutting speeds (approximate) used by Mack-Hemp's machining department. Feeds and depths of cut vary widely depending on the roll and the power of the lathe available. These speeds are offered simply as a guide and should be adjusted to individual requirements.

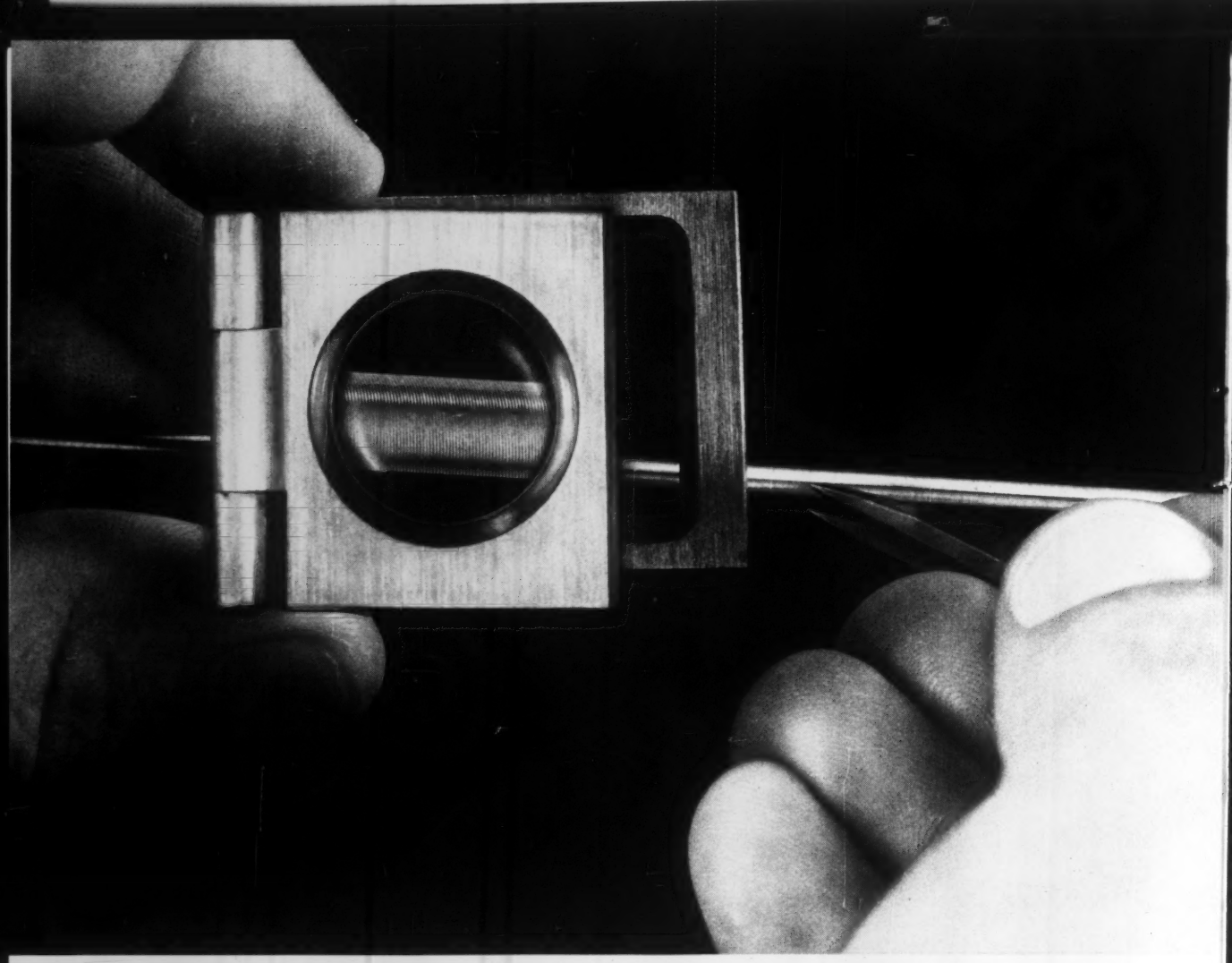
MACKINTOSH-HEMPHILL

You get more tonnage from the rolls with the Striped Red Wabblers

Division of E. W. BLISS COMPANY

Presses, Rolling Mills, Special Machinery





How "high fidelity" in music spring wire licks a big production problem

Leading producers of carbon paper apply the carbon coating by means of steel rods closely wound with hair-fine music wire. The wire-to-wire valleys, as determined by wire diameter, control the amount of carbon deposited.

Here is a case where product quality and smooth, uninterrupted production are both dependent on extreme uniformity in the fine wire being used—extreme uniformity in diameter, finish and temper.

This super-critical wire is produced by the Worcester Wire Works Division of National-Standard. Because it does the best job by production comparison, it's naturally preferred. Keep this in mind and check with the Worcester Wire Works Division on your next need for fine wire if quality control is at all a factor. You'll get the finest of *service*, too!

NATIONAL NS NATIONAL-STANDARD Company **STANDARD**

DIVISIONS: NATIONAL-STANDARD, Niles, Mich.; *fine wire, stainless, music spring and plated wires* • **WORCESTER WIRE WORKS, Worcester, Mass.;** *music spring, stainless and plated wires, high and low carbon specialties* **WAGNER LITHO MACHINERY, Bogotá, N. J.;** *metal decorating equipment* • **ATHENIA STEEL, Clifton, N. J.;** *flat, high carbon spring steels* • **REYNOLDS WIRE, Dixon, Ill.;** *industrial wire cloth*

CALENDAR

OF MEETINGS

Apr. 28-30, Rail Steel Bar Association: Annual meeting, Williamsburg Inn, Williamsburg, Va. Association's address: 38 S. Dearborn St., Chicago 3, Ill. Secretary: W. H. Jacobs.

Apr. 30-May 2, Grinding Wheel Institute and Abrasive Grain Association: Semi-annual meeting, Grand Hotel, Point Clear, Ala. Managers: Thomas Associates Inc., 2130 Keith Bldg., Cleveland 15, Ohio.

Apr. 30-May 3, National Screw Machine Products Association: Annual meeting, Drake Hotel, Chicago. Association's address: 2860 E. 130th St., Cleveland 20, Ohio. Executive vice president: Orrin B. Werntz.

May 1-8, American Society of Tool Engineers: Tool show and annual meeting, Convention Center and Ben Franklin Hotel, Philadelphia. Society's address: 10700 Puritan Ave., Detroit 38, Mich. Executive secretary: Harry E. Conrad.

May 3-6, National Tool & Die Manufacturers Association: Spring board meeting, Statler Hotel, Washington. Association's address: 907 Public Square Bldg., Cleveland 13, Ohio. Executive vice president: George S. Eaton.

May 4-7, Liquefied Petroleum Gas Association Inc.: Annual meeting and exhibit, Conrad Hilton Hotel, Chicago. Association's address: 11 S. LaSalle St., Chicago 3, Ill. Secretary: Arthur C. Kreutzer.

May 5-6, Iron & Steel and Institute of Metals Divisions, American Institute of Mining, Metallurgical & Petroleum Engineers: Conference on properties of high-strength steels, Penn-Sheraton Hotel, Pittsburgh. Institute's address: 29 W. 39th St., New York 18, N. Y. Secretary: Ernest Kirkendall.

May 5-6, American Institute of Mining, Metallurgical & Petroleum Engineers: High temperature materials conference, Ambassador Hotel, Los Angeles. Institute's address: 29 W. 39th St., New York 18, N. Y. Secretary: Ernest Kirkendall.

May 5-7, Machinery Dealers National Association: Annual meeting, Eden Roc Hotel, Miami Beach, Fla. Association's address: 1346 Connecticut Ave. N.W., Washington 6, D. C. Secretary: R. K. Vinson.

May 5-8, National Welding Supply Association: Annual meeting, Americana Hotel, Miami Beach, Fla. Association's address: 1900 Arch St., Philadelphia 3, Pa. Secretary: R. C. Fernley.

May 7-17, United States World Trade Fair: New York Coliseum, New York. Information: United States World Trade Fair, 331 Madison Ave., New York 17, N. Y.

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9 sizes: 3, 5, 6, 7½, 8, 10, 12, 15, 30 tons capacity. Fluid Drive, Power Steering. Write for Bulletin No. 77.

shrink days into hours...

Tedious, costly work of Loading, Unloading and Stacking that take many men, many days can be compressed into a few hours . . . with just *one* man operating SILENT HOIST materials handling equipment . . . *releasing crews for other productive chores.* Costs rising? Competition rugged? SILENT HOIST may have an interesting answer for you! Details of some important case-histories will be furnished—cheerfully, without obligation.

SILENT HOIST & CRANE CO.
Brooklyn 20, N.Y.

SILENT HOIST KRANE KAR

HYDRAULIC Boom Swinging, HYDRAULIC Topping, HYDRAULIC Telescoping, HYDRAULIC Load Hoisting! Fluid Drive, Power Steering. 5 Sizes: 1½, 2½, 5, 10, 12½ ton capacities. Ask for Bulletin No. 79.

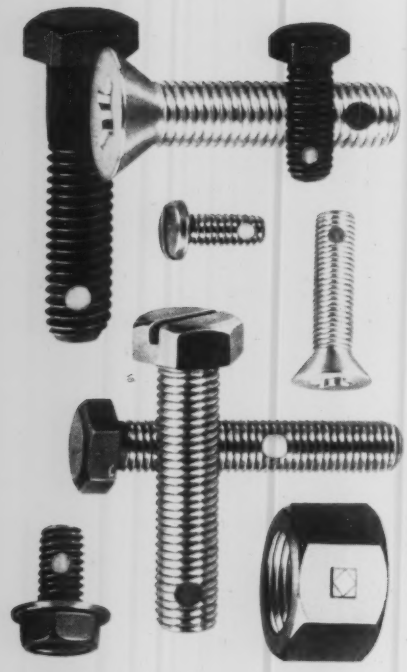
"We've built a better mouse trap with REPUBLIC ELECTRO PAINTLOK SHEETS"

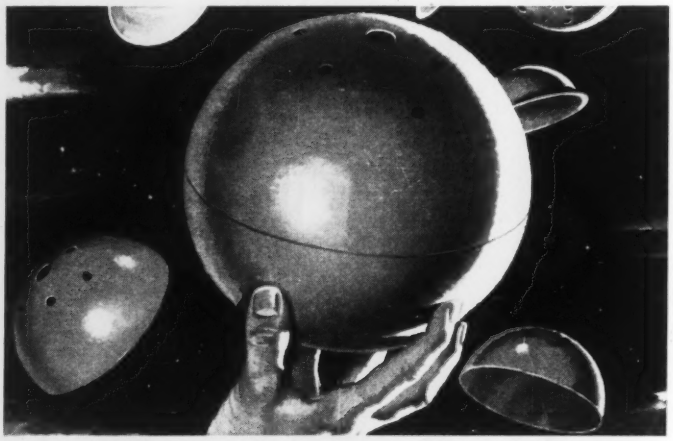
"If we expected the world to beat a path to our door," continues Mr. Coughanor, "we knew every detail of design and material in the Self Sett Trap had to be exactly right. As a result, extensive tests have been conducted which prove design efficiency. And experience has proved Republic Electro Paintlok is the best steel sheet we can buy for economy, long life, and excellent paint-holding qualities. The combination of these factors gives us the best, safest, most foolproof product on the market."

This enthusiasm for Republic Electro Paintlok® is echoed by many other product manufacturers faced with a wide range of forming and application problems. The reason is the chemically treated zinc surface of Republic Electro Paintlok which leaves the mill in prime condition for painting, and won't crack, flake, or peel under any forming operation permitted by the base metal.

These features of Electro Paintlok protect the applied finish of completed products—holding it tightly and restricting corrosion to the point of damage if it should be scratched through.

If you want to "build a better mouse trap" in your product field, it will pay you to get all the facts on versatile Republic Electro Paintlok. Contact your Republic representative or mail coupon.

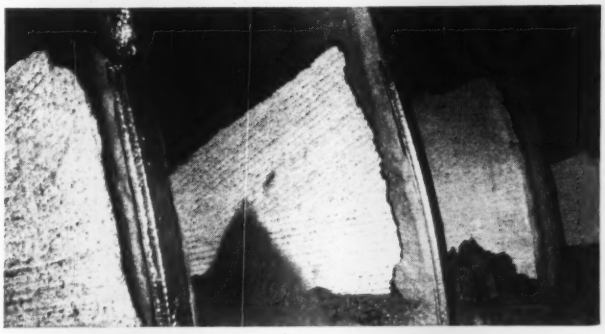




BETTER OVER-ALL PERFORMANCE WAS MADE POSSIBLE through the use of Republic Titanium in the manufacture of these hemispheres by Alloy Products Corporation, Waukesha, Wisconsin. Used for special aeronautical applications, completed spheres provide light weight without impairing safety; strength to contain 2,000 p.s.i.; extreme corrosion resistance to chemically active contents. Beyond providing product advantages, Republic Titanium is easy to draw, pierce, and weld. Little change in fabricating procedure is required as compared with other construction materials. Send coupon for data.

BETTER SERVICE FROM BOLTED ASSEMBLIES subject to impact and vibration can be secured when they are fastened with Republic Nylok® Bolts and Nuts. The resilient nylon pellet imbedded in the body of bolt or nut forces a tight metal-to-metal lock between opposite mating threads. Pellet is unaffected by age or moisture and permits both adjustment and re-use without loss of holding power. Lock is secure even if fastener is not seated. For details, send coupon.

says Mr. E. S. Coughanor,
President, Self Sett
Mouse Trap Company,
Cleveland, Ohio



OPERATION OF THE SELF SETT MOUSE TRAP, as indicated here by Mr. Coughanor, depends on both ingenious design and corrosion resistant materials. A series of automatic doors and pivoted ramps leads the rodent to his destruction in a tank of water. The special coating on Republic Electro Paintlok holds painted finish securely to provide long-term corrosion resistance required to maintain trap operating efficiency.

BETTER COAL "FINE" RECOVERY RATE WAS SECURED when the cotton fabric on this coal-cleaning plant disc-type filter was replaced with a finely woven mesh of Republic ENDURO® Stainless Steel. In addition to doubling efficiency, ENDURO provides far longer service. Republic ENDURO is available in all standard forms, finishes, and analyses. For full information, mail coupon.

REPUBLIC STEEL

World's Widest Range of Standard Steels and Steel Products

REPUBLIC STEEL CORPORATION
DEPT.EO-5251
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Please send more information on:

☐ Electro Paintlok ☐ Titanium
☐ ENDURO Stainless Steel ☐ Nylok Fasteners

Name _____ Title _____

Company _____

Address _____

City _____ Zone ____ State _____

Bridgeport Brass chooses
SPEEDOMAX® H CONTROL
for vacuum annealing Ti, Zr
and special alloys

Bridgeport, Conn.—Vacuum anneal . . . cool . . . then draw! Again and again . . . until the seamless tube of titanium, zirconium or special alloys takes final dimensions.

That's the procedure at Bridgeport Brass Company's Housatonic Plant where reliable Speedomax H temperature control is helping them produce tube after tube of the same high quality.

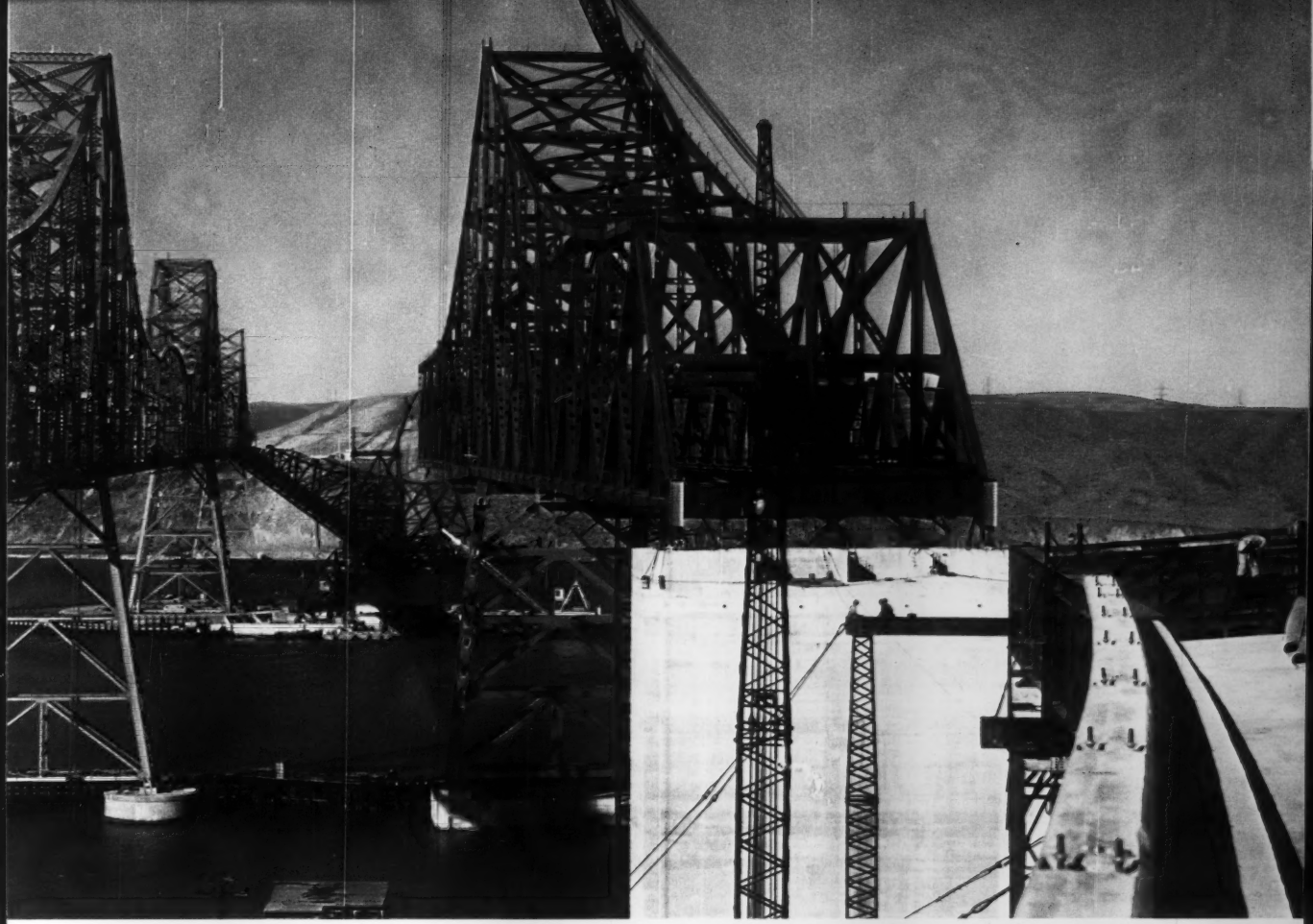
Quantity production of these tubes requires close control of all variables, particularly atmosphere and temperature.

To minimize loss of the expensive "new" metals and to maintain chemical and physical characteristics, Bridgeport Brass Co. installed a HIVAC vacuum annealing furnace with a Westinghouse heating chamber over a year ago. With evacuation held to 0.01 micron, four Speedomax H instruments provide D.A.T. control . . . constantly regulate power input to hold product temperature well within specifications. Such dependable automatic control is resulting in production savings which make the use of these new metals more economical.

You may not be vacuum annealing . . . but no matter what your heat treat, it'll pay you to investigate Speedomax H. Its workhorse characteristics . . . its two to four week delivery . . . and its moderate price now, more than ever before, make this null-balance controller an attractive investment.

A phone call or letter to your nearest L&N office or to 4957 Stenton Ave., Phila. 44, Pa. will bring more information. Ask for data sheets.

LEEDS NORTHRUP
Instruments Automatic Controls • Furnaces



South cantilever section and part of suspended span erected; work begun on north tower seen in background. Total length of new bridge is 3350 feet, four lanes wide. Designer: California Division of Highways. Fabricators and Erectors: American Bridge Division, United States Steel.

Going up:

The bridge in which USS "T-1" Steel saved $800,000

The Carquinez Strait Bridge is the first major bridge use of USS "T-1" Constructional Alloy Steel, the first large bridge in which all truss members were fabricated by welding, and unique in that the specification of an alloy steel saved $800,000 in construction costs alone.

Like its 31-year-old counterpart, it will connect the San Francisco Bay area with the Sacramento Valley. In profile, the two bridges look like twins, but are vastly different in construction. First, to build the wider, heavier bridge without exceptionally massive members, a weldable, tremendously strong steel was needed. USS "T-1" Steel's yield strength (90,000 psi minimum), combined with its weldability, filled the bill—cutting weight of some members by nearly one-half their equivalent A242 design, and saving $800,000.

Second, welded construction in the new bridge will greatly minimize maintenance expense. It costs about $70,000 yearly to clean and paint the old bridge. By getting rid of thousands of vulnerable rivet heads, edges, lacing bars and angles in the new bridge, members will be less susceptible to corrosion and far easier to maintain and paint.

All in all, 2910 tons of "T-1" Steel are used in the bridge's most heavily stressed members. Also used: 5370 tons of USS TRI-TEN Steel, a weldable high-strength low-alloy steel, and 6440 tons of structural carbon steel. Each of these steels—all available from United States Steel—plays an important role in the bridge, helping to make possible the "most bridge for the money."

For more information. Write for our comprehensive books entitled "T-1" and "TRI-TEN." You'll find in them a wealth of engineering and metallurgical data. Or, contact our nearest representative—you'll find him listed in the telephone directory. United States Steel, 525 William Penn Place, Pittsburgh 30, Pa.

USS, "T-1" and TRI-TEN are registered trademarks

United States Steel Corporation – Pittsburgh
Columbia-Geneva Steel – San Francisco
Tennessee Coal & Iron – Fairfield, Alabama
United States Steel Supply – Warehouse Distr.
United States Steel Export Company

USS United States Steel

Father and son total 70 years machining steel

At the U. S. Steel Homestead Forge Shop, you find a lot of men who carry on in the shoes of their fathers. Gus Seitz's father was a Journeyman Machinist for 30 years before he retired. Gus started in the shop when he was 16, worked as an apprentice, Journeyman Machinist, Inspector. After six years in Production Control, he moved up to General Foreman, a post he has held for 10 years. With 40 years of machining experience behind him, Gus supervises a staff of 256.

His most important job: see that the work is carried out to the customer's specifications, *on time*.

The forgings in the picture illustrate some of the scheduling problems that Gus has to solve. These are closure head flanges for a nuclear reactor—130″ OD, 88″ ID and 35″ high. Ingots were cogged, upset, punched and forged over a mandrel. Then they received the preliminary machining. Next came a quench-and-temper heat treatment to meet the physical properties needed by the reactor builder. Then followed about 10 days of testing for microstructure, tensile strength and ductility. Finally, the forgings were scheduled back onto the 20-foot vertical boring mill for final machining.

With men like Gus Seitz riding herd on your USS Quality Forging order, you can rest assured that money won't buy a better piece of steel. U. S. Steel has the men, the know-how, the equipment and steel to turn out forgings for the most critical service, and we're eager to help you solve your forgings problems. Write for our free 32-page booklet on USS Quality Forgings. Send your requests to United States Steel, Room 2801, 525 William Penn Place, Pittsburgh 30, Pa. *USS is a registered trademark*

USS

United States Steel Corporation—Pittsburgh
Columbia-Geneva Steel—San Francisco
Tennessee Coal & Iron—Fairfield, Alabama
United States Steel Export Company

United States Steel

How U. S. Steel Supply's Any Steel, Anywhere, Any Time Service "cut our inventories"

reported by
Mr. C. R. Campbell,
Materiel Manager,
Rohr Aircraft Corporation,
Chula Vista, California

"Maintaining large inventories cramped our production area," says Mr. Campbell. "However, as a result of U. S. Steel Supply's ANY STEEL, ANYWHERE, ANY TIME SERVICE, these inventories have been cut considerably.

"Our orders are placed with U. S. Steel Supply's Los Angeles plant and, when necessary, can be filled and delivered on an overnight basis. No longer are we forced to anticipate our needs for more than a 45-day period, as compared to the 90-day *minimum* advance period for mill orders.

"U. S. Steel Supply's ANY STEEL, ANYWHERE, ANY TIME SERVICE gives us immediate delivery on any type or grade of material, eliminates mill 'lead time' and helps solve our 'dead inventory' problems."

You, too, can benefit by this service!

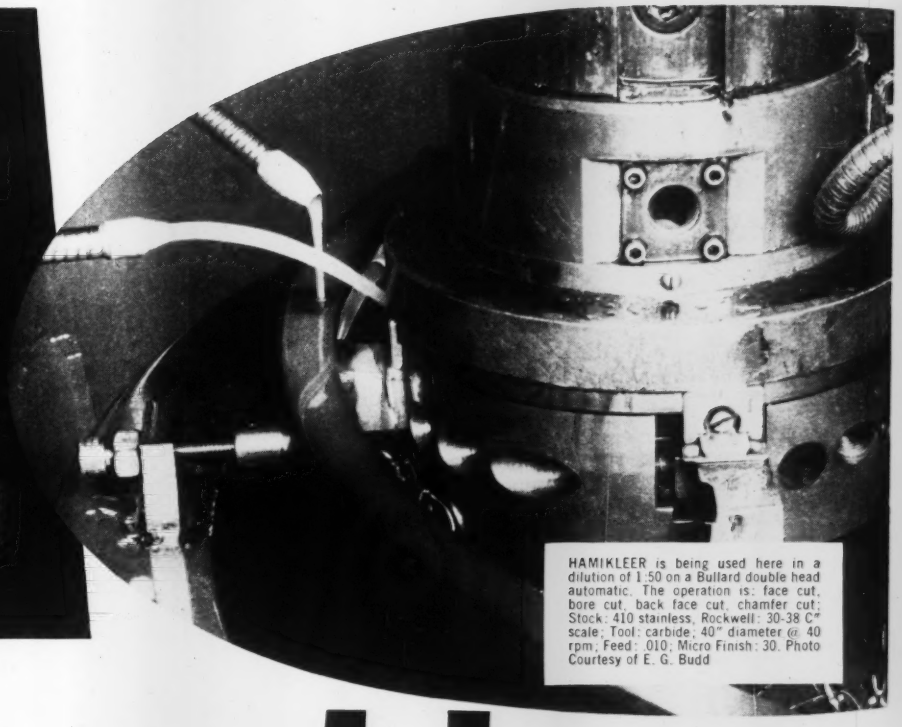
Let one of our representatives show you how other steel users are saving money and increasing profits as a result of ANY STEEL, ANYWHERE, ANY TIME SERVICE. There's a good chance he can help *you* eliminate idle equipment, increase production, and cut inventory costs. Write to U. S. Steel Supply at the address below.

Remember . . . you get Any Steel, Anywhere, Any Time Service from . . .

U. S. Steel Supply
Division of USS TRADEMARK **United States Steel**

Mailing Address: P. O. Box 1099, Dept. 15, Chicago 90, Ill. · General Offices: 208 South La Salle Street, Chicago 4, Ill.

the first oil-free water soluble coolant!



HAMIKLEER is being used here in a dilution of 1:50 on a Bullard double head automatic. The operation is: face cut, bore cut, back face cut, chamfer cut; Stock: 410 stainless, Rockwell: 30-38 C" scale; Tool: carbide; 40" diameter @ 40 rpm; Feed: 010; Micro Finish: 30. Photo Courtesy of E. G. Budd

hamikleer

REG. U.S. PAT. OFF.

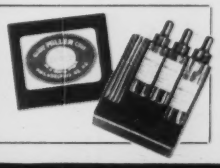
offers more outstanding metalworking benefits

Replace soluble oils with HAMIKLEER and you'll get many more outstanding benefits. This *oilless* coolant:

- **Outlasts soluble oil emulsions by five times.**
- **Prevents rust** eliminating the need for and cost of cleaning operations.
- **Requires less expensive make up** since only water is added to the solution.
- **Will not affect workers' skin, turn rancid or foam** saving operators' time.
- **Permits gauging while the machine operates,** saving shutdowns.
- **Provides finer surface finishes, longer tool life** eliminating rejects.
- **Lowers inventory costs** since it can be used on many different metalworking operations.
- **Eliminates costly disposal problems.** It will not pollute streams if oils are kept out of the mixture.

HAMIKLEER mixes with any water to form true clear solutions. These solutions can be made more dilute than is practical for ordinary soluble oils and they are more efficient at the longest range dilution . . . as proved by years of experience in plants throughout the country. Write for a free sample to test on your own metalworking operations.

This free test kit is sent to all HAMIKLEER users. It permits operators to test dilution right at the machine, *saving considerable time.*



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Original Products and Processes Since 1936

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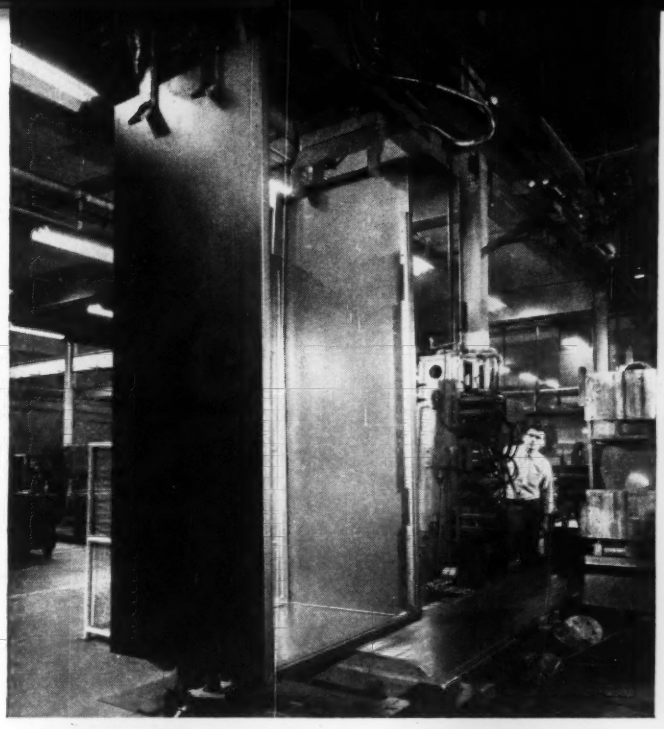
DAvenport 4-4000 *Service Representatives in Principal Cities*

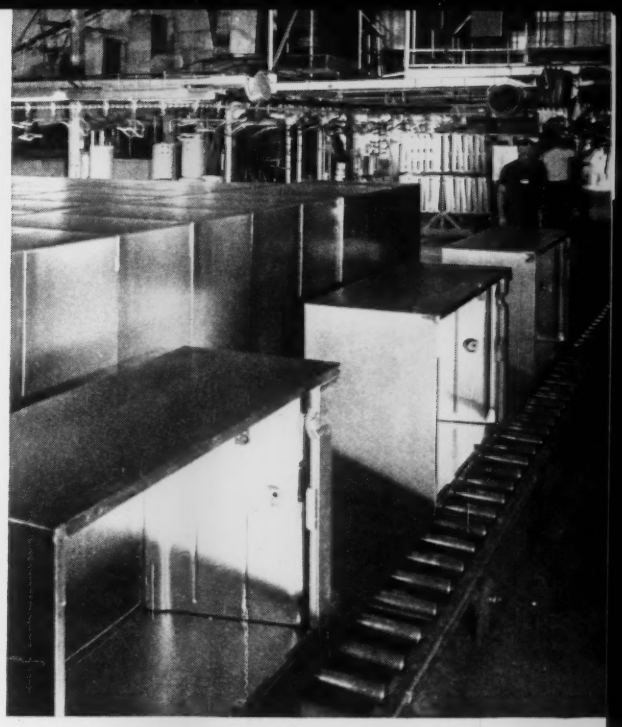
PITTSBURGH STEEL'S cold-rolled sheet passes critical surface inspection as . . .

The 3 F's in Pittsburgh Steel's Sheets Keep Automated Lines Rolling at Westinghouse

STEEL that is free of flaws is vital to the gleaming painted surface of finished refrigerator.



COMPLETELY FORMED by automated equipment, refrigerator's shell then moves to welding operation.



3 F's—Flatness, Finish, Formability—show up here as outer shells await painting.

"If we made 75 a day then, we were really going. Now, we're geared up here to make more than twice that in an hour."

That quote came from a veteran production man at Westinghouse Electric's huge and humming Appliance Division plant near Columbus, Ohio.

The difference between daily production of 75 refrigerators (in 1927) and today's rate is explained by just one word—automation.

Production of the refrigerator's steel shell is automated completely through welding. This includes some 15 distinct operations required to convert smooth, precisely dimensioned cold rolled sheet steel into the outer shell of a home refrigerator.

Part of Westinghouse's ability to use advanced production methods is due to the steel available from suppliers like Pittsburgh Steel Company.

H. L. Johnson, the plant's purchasing agent, and Joseph A. Scattoloni, staff supervisor of manufacturing engineering, agree that automation places special responsibilities on their steel suppliers. As Mr. Scattoloni puts it:

"Westinghouse built its reputation on quality products, but we can't build quality when it isn't in the materials to start with."

Pittsburgh Steel knows—even without automation to consider—that sheet going into appliances must have the Three F's—Flatness, Finish and Formability. Add requirements of automation and you need these same qualities, but more so. Here's why they're so vital.

• **Dimensional accuracy**—A variation of as little as .005 inch could compound into a total error large enough to interrupt production, scrap a shell or both.

To produce a shell, automatic equipment has to make six 90-degree bends, as well as a smaller seventh one. If the sheet isn't flat or if it lacks uniform temper, bends can be thrown off.

Once bends are made, the sheets can't be allowed to spring back. Over-bending, too, will scrap a shell. That gets costly when you consider that the shell—at about 94 pounds—is the largest single item in the 140-150 pounds of steel per finished refrigerator.

If the sheet isn't flat, waviness will show up glaringly in the finished shell, or it could cause an "oil-canning" effect. This poses a threat to the painted surface.

If camber isn't within specific limits, sheets can't be held properly during blanking and punching. Holes creep beyond tolerances, ultimately scrapping the shell.

• **Surface finish**—Since the shell must take a uniform and critical painting, surface finish is all-important.

Rust, scale, piping, pits—singly, or in combination—can ruin a shell, so Pittsburgh Steel knows why flaw-free steel is a must.

• **Formability**—Another name for shapeliness—is more vital in automatic forming than in a hand operation. And strain marks resulting from improperly bent sheet will require either complete scrapping or correction by expensive hand machine methods.

Westinghouse stakes its reputation on quality of its products. A supplier who can provide Westinghouse with this quality can meet your needs, too. The full range of hot-and-cold rolled sheet and strip, produced exactingly on the steel industry's finest mill equipment—is as close as your telephone. Call any of the Pittsburgh Steel Company district sales offices listed here. Do it today!

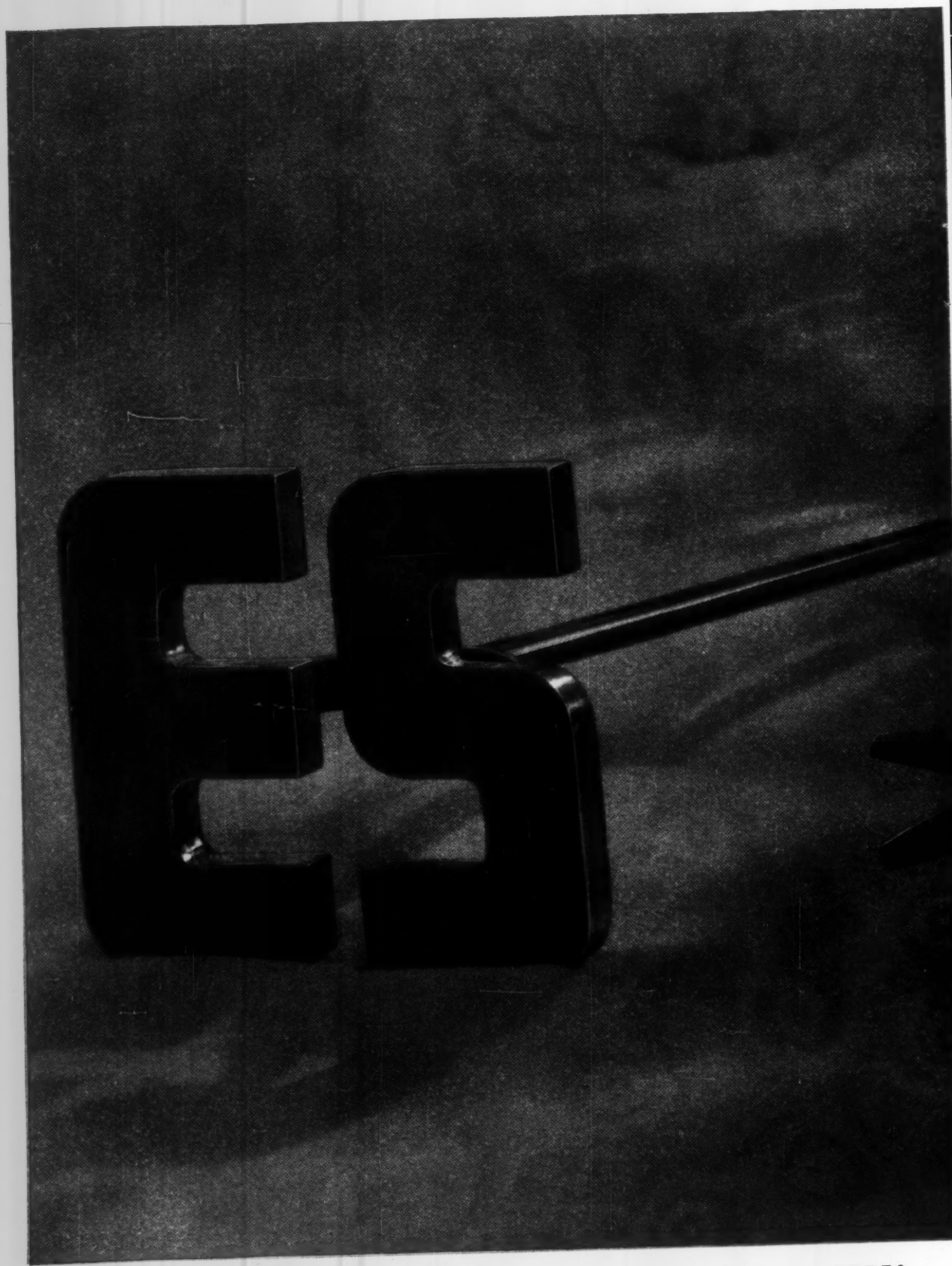
Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

District Sales Offices

Atlanta	Cleveland	Dayton	Los Angeles	Pittsburgh
Chicago	Dallas	Detroit	New York	Tulsa
		Houston	Philadelphia	Warren, Ohio

(Advertisement)



In stainless steel sheets and plates, the
best known brand in the world is
Eastern! And from east to west . . . for industrial
and product applications covering literally thou-
sands of different requirements . . . Eastern's
products and services are available through the
finest organization of warehouse distributors in
the whole new world of stainless steel. Write
for your distributor's name.
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ARC WELDING AT WORK CUTTING COSTS

Weld questionable steels with . . .

JETWELD LH-70

- *Outstanding overhead and out-of-position operation*
- *High physical properties*
- *Fast, easy iron powder action*

Jetweld LH-70 operates overhead with the smooth, fast action—and has the high physical properties of a low hydrogen rod.

Produces crack-free welds on heavy plate with a minimum of stress relieving. Reduces the need for preheat on medium carbon steels—makes porosity free welds on sulphur bearing steel.

A.W.S. Classification E-6016.

Look for the three dots • • • symbol of Lincoln quality. Weldirectory of Lincoln mild steel electrodes Bulletin 7000.1 sent free on request.

The World's Largest Manufacturer of Arc Welding Equipment

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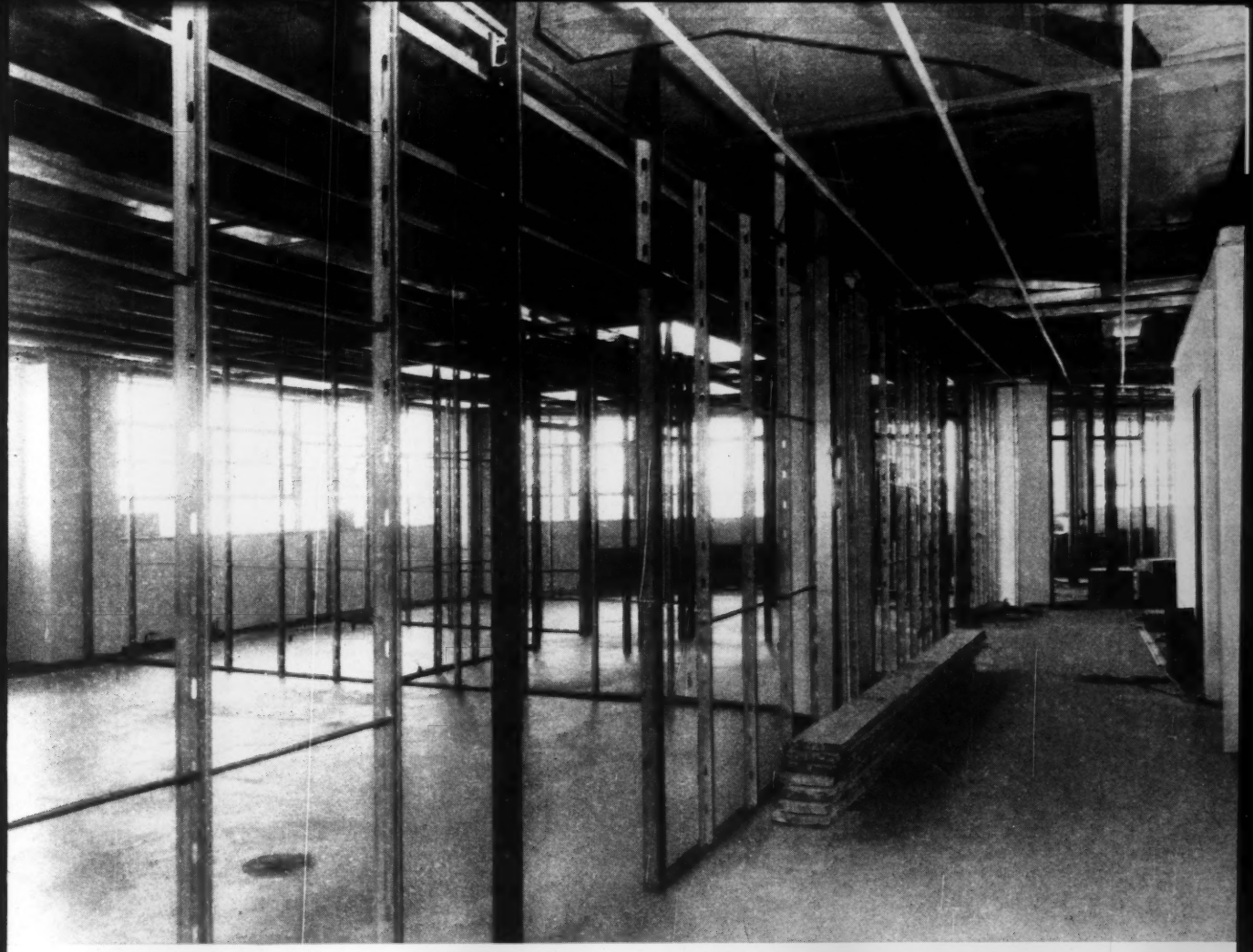

"STRONG. FIRE-RESISTANT. CORROSION-RESISTANT. THAT'S WHY WE USE WEIRZIN IN OUR STUD SYSTEMS!"

says G. A. Stevenson, vice president of Penn Metal Company, Inc., Parkersburg, W. Va., maker of PERMALOCK nailable metal stud systems.

"Broadly speaking, our choice of Weirzin electrolytically zinc-coated steel is based on two factors: performance in our products and performance in our production lines.

"With Weirzin, of course, our stud systems have the strength, rigidity and high degree of fire resistance inherent in steel. And because Weirzin's zinc coating is completely integrated with the steel, we have the added assurance of a corrosion-free life for our systems.

"In our production lines, Weirzin goes smoothly through every operation—no flaking or peeling regardless of the severity of the fabrication stresses.

"Briefly, we feel that Weirzin has helped us to produce a quality product that gives our customers solid value at low cost."

Strong! Highly resistant to fire! Highly resistant to corrosion! Easy to fabricate! That's Weirzin electrolytically zinc-coated steel. For more information on Weirzin send for free booklet. Write Weirton Steel Company, Dept. B-17, Weirton, West Virginia.

WEIRTON STEEL COMPANY

WEIRTON STEEL COMPANY

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cleaning: it pays to find the easy way

Here painted cast iron parts are being cleaned cold, in one safe, long lasting, and economical bath (Houghto-Clean Cold Cleaners). In one fast, easy operation, shop dirt and cutting oil disappear and paint is unaffected. No two-stage cleaning needed, no foam, no fumes, no repainting.

You can save time and effort the same way today, thanks to some truly unique new Houghto-Clean cleaners.

Why not check into the capabilities of Houghton's modern metal cleaners? There's an amazing selection. And there's also free technical help at your disposal. You can often get the benefits of cleaners that fit your needs . . . without paying a high price for special formulations.

Call the Houghton Man in your area right now. Find out how modern Houghton chemistry speeds and simplifies the full range of industrial metal cleaning.

CHECK YOUR CLEANING NEEDS AGAINST THESE MODERN HOUGHTON CLEANERS

- ☐ Room Temperature Cleaners . . . Houghto-Clean Series
- ☐ General Purpose Tank Cleaner . . . Houghto-Clean 240
- ☐ Power Washers . . . Houghto-Clean 205 or 270
- ☐ Aluminum . . . Houghto-Clean CS
- ☐ Emulsion Cleaner . . . Houghto-Clean 220
- ☐ Salt Bath Cleaner . . . Houghto-Clean 245 and/or Cerfak Liquid
- ☐ Acid Phosphate Cleaner (prior to painting) . . . Houghto-Clean 313-A

Write for the new booklet, "Metal Cleaning Compounds by Houghton" which describes all these and more, made to serve you. E. F. Houghton & Co., 303 West Lehigh Avenue, Philadelphia 33, Pennsylvania

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PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO

Ready to give you on-the-job service . . .

STEEL

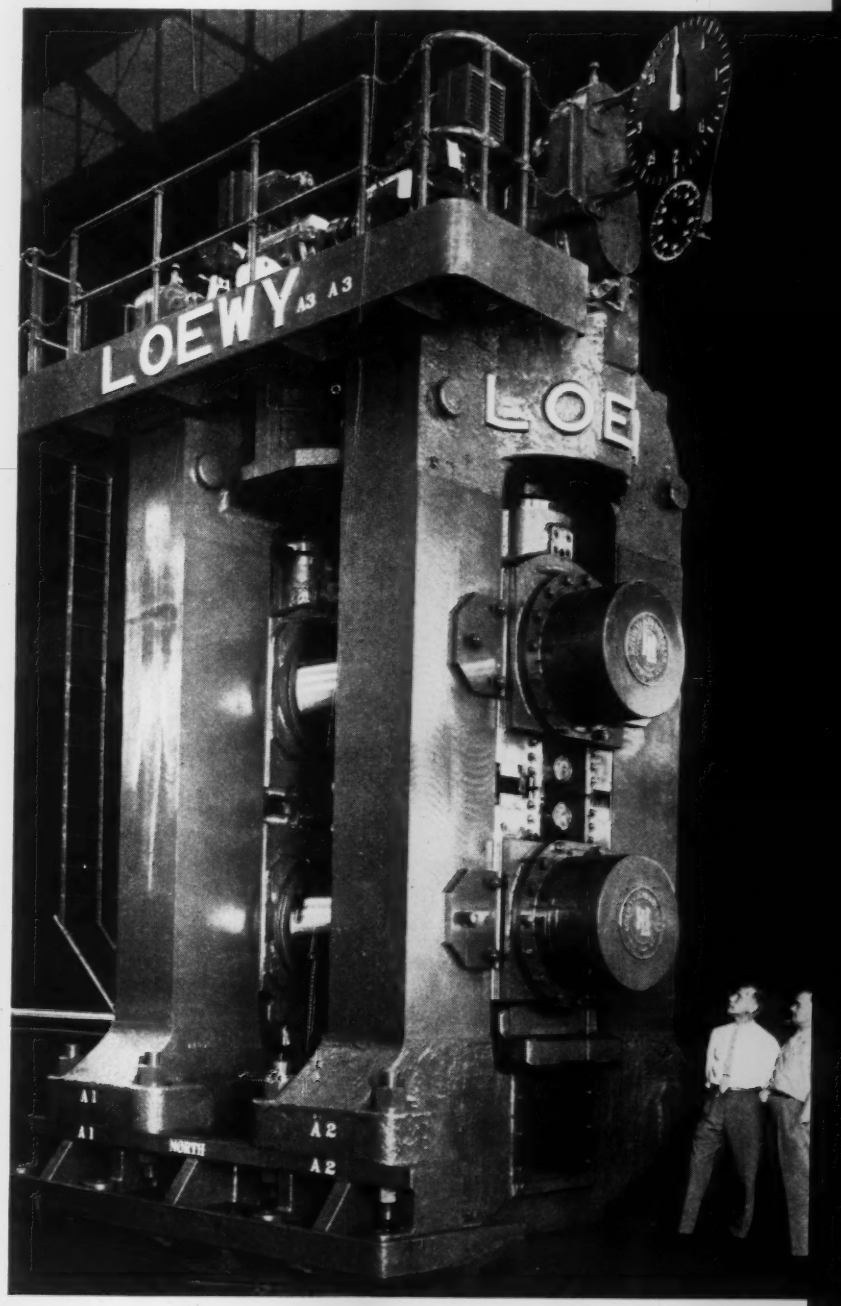
Loewy-Hydropress delivers powerful reversing mill within just 10 months of order date

Within only 10 months of the time it was given the go-ahead signal, Loewy-Hydropress has designed, built and delivered a rugged and powerful reversing mill for rolling slab ingots of particularly hard alloys.

The smooth operation and high efficiency of this unusual metal-forming installation can be attributed to Loewy's exceptional design ingenuity and wide engineering experience. But how was it possible to build it in record time, to supply it *ahead* of the promised delivery date? The answer is simple. As a division of Baldwin-Lima-Hamilton, Loewy-Hydropress has at its disposal the vast, yet smoothly integrated, resources of one of the nation's most diversified industrial organizations. B-L-H's unsurpassed facilities assure you of products that meet the most exacting quality requirements. And close coordination among all B-L-H divisions is the chief reason why Loewy-Hydropress can deliver your rolling mills faster.

Outstanding Loewy rolling mill installations for steel and nonferrous metals are operating in this country and abroad. Loewy designs, builds and installs rolling mills for hot and cold strip, sheet, foil, plate and wire rod; blooming mills, slabbing mills, rail and structural mills, billet mills, skelp mills, merchant mills, laboratory mills, specialty mills, and auxiliary equipment.

For detailed information, write us today, Dept. B-1.



Shown here on the erection floor is a 4-high rolling mill for newly developed hard alloys which was designed and built by Loewy-Hydropress.

Loewy-Hydropress Division

BALDWIN · LIMA · HAMILTON

111 FIFTH AVENUE, NEW YORK 3, N.Y. Rolling mills • Hydraulic machinery • Industrial engineering

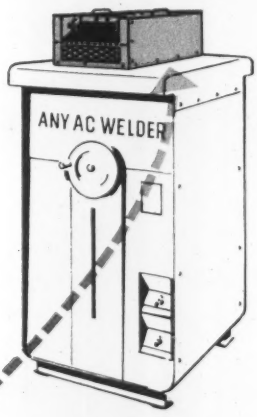
BALDWIN BLH LIMA-HAMILTON

Convert any* a-c welder

New A. O. Smith convertor units give any shop more versatility

Compact 250-amp and 450-amp units sit on top of any a-c welder.

to d-c in 60 seconds!



New way to up flexibility

Now, with either of two A. O. Smith convertor units, *any* a-c welder in your plant can be quickly converted to all of your d-c welding needs.

Either of these two new A. O. Smith convertors can be used with *any manufacturer's a-c welder of any amperage!*

And, as indicated below, you can hook up these convertors in a matter of seconds — for temporary, intermittent or permanent operation.

*** No matter which make a-c welder you currently use, here are advantages A. O. Smith convertors offer—**

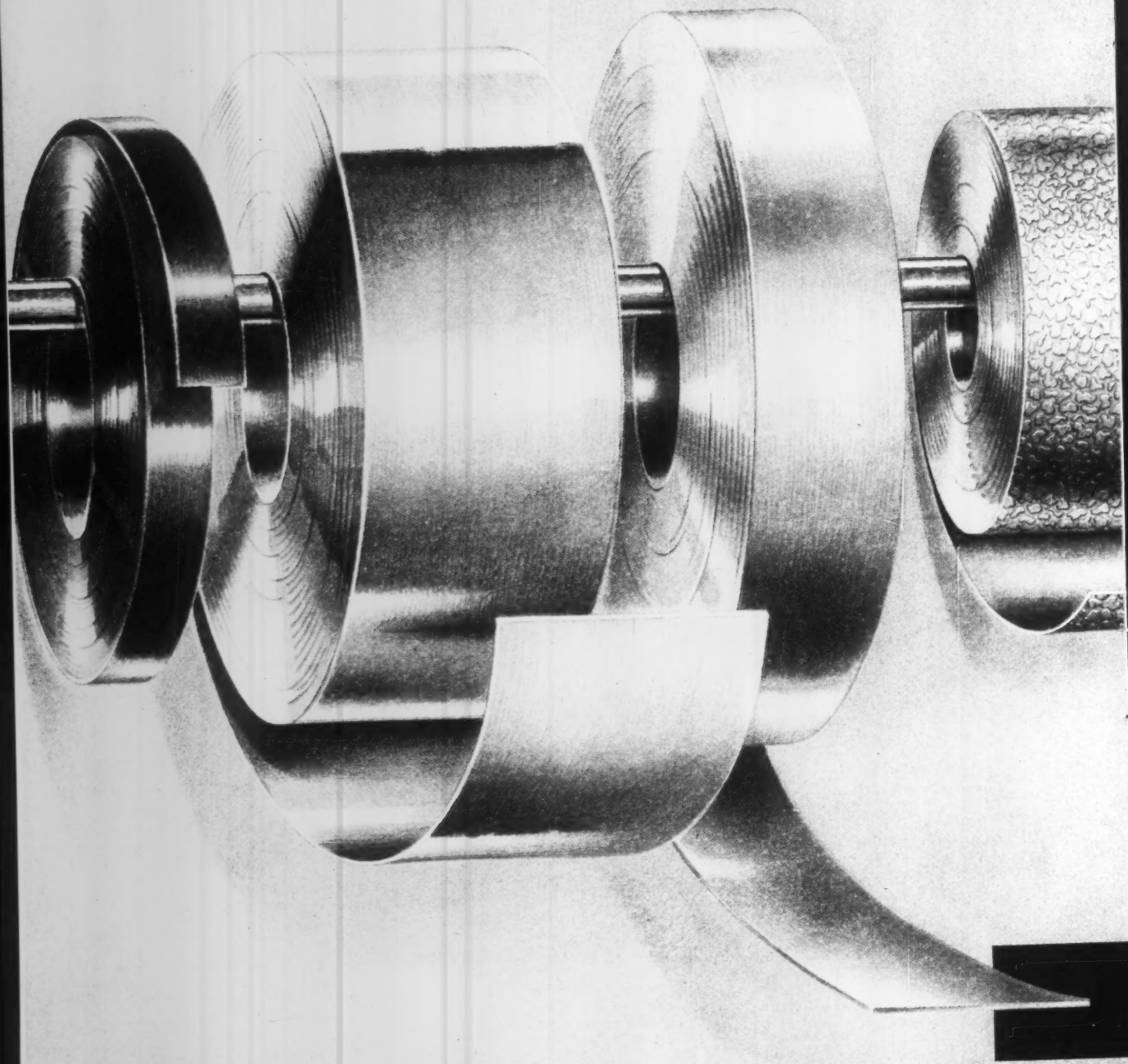
- Complete polarity switch permits fingertip selection of d-c straight, d-c reverse or a-c current without touching leads.
- 250-amp unit is rated at 60% duty cycle or 300-amps at 40% duty cycle. 450-amp unit is rated at 60% duty cycle or 500-amps at 45% duty cycle.
- Completely self-contained — not special kits designed for specific welders.
- Easily portable — can be kept in the tool crib . . . quickly delivered wherever needed.
- 60-second hook-up — two cable connections to welder output, two connections to the leads.
- Internal overload protection.
- Smoothing reactor to keep ripple low, arc stable.
- Blower-cooled for maximum cooling, quiet operation.
- Long-life *silicon* rectifiers.

If you don't have an a-c welder, you're missing a lot in welding flexibility. It's time to check the line of A. O. Smith a-c welding machines: 180-1500 amps.

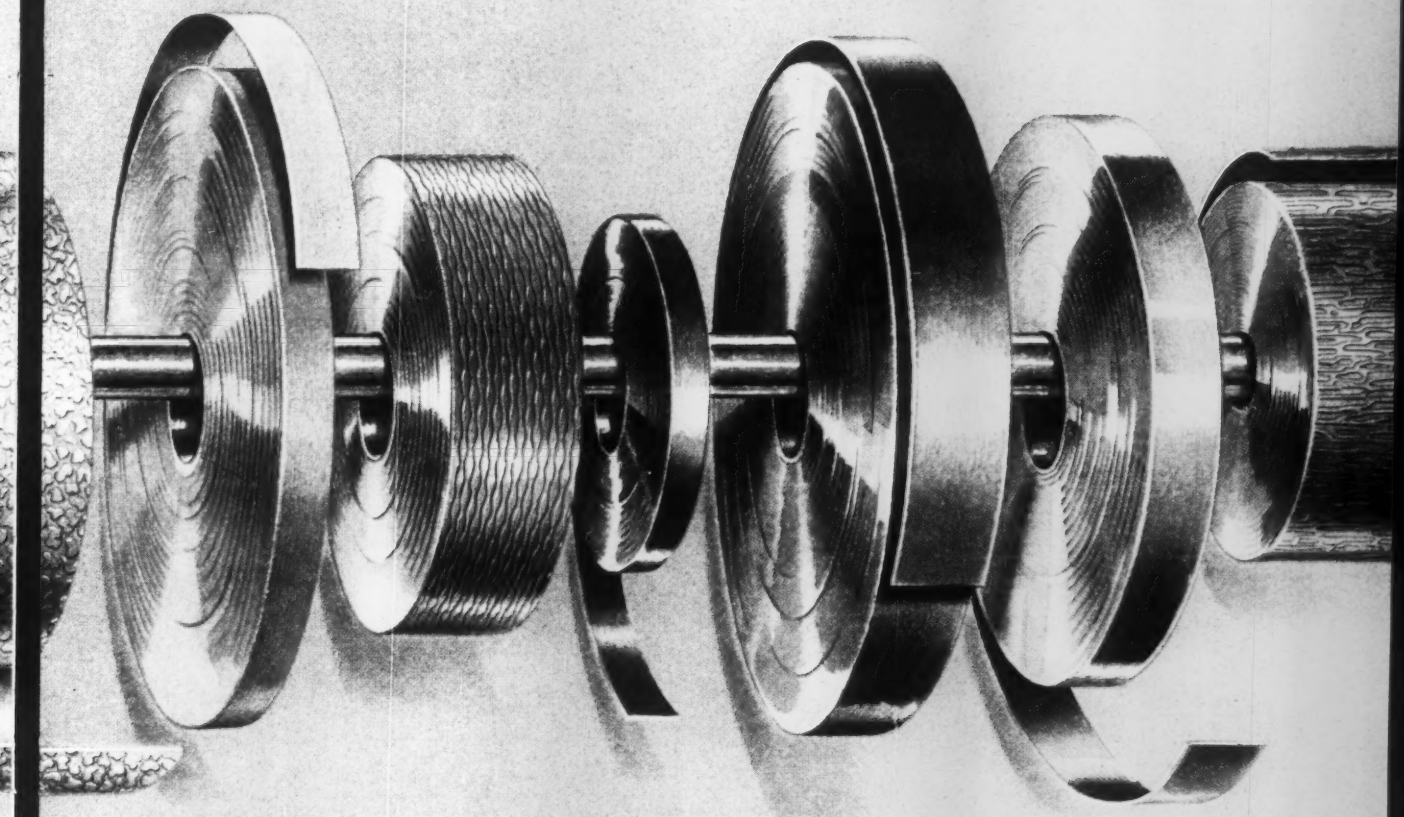
Through research A.O. Smith *. . . a better way*

A.O.Smith
CORPORATION
WELDING PRODUCTS DIVISION
Milwaukee 1, Wisconsin
A. O. Smith International S. A., Milwaukee 1, Wisconsin, U. S. A.

SHARON . . .



. . . a big name in specialty steels



For missiles or mixers, rockets or razors—whatever your steel requirements —depend on Sharon for consistent quality . . . exactly to your specifications.

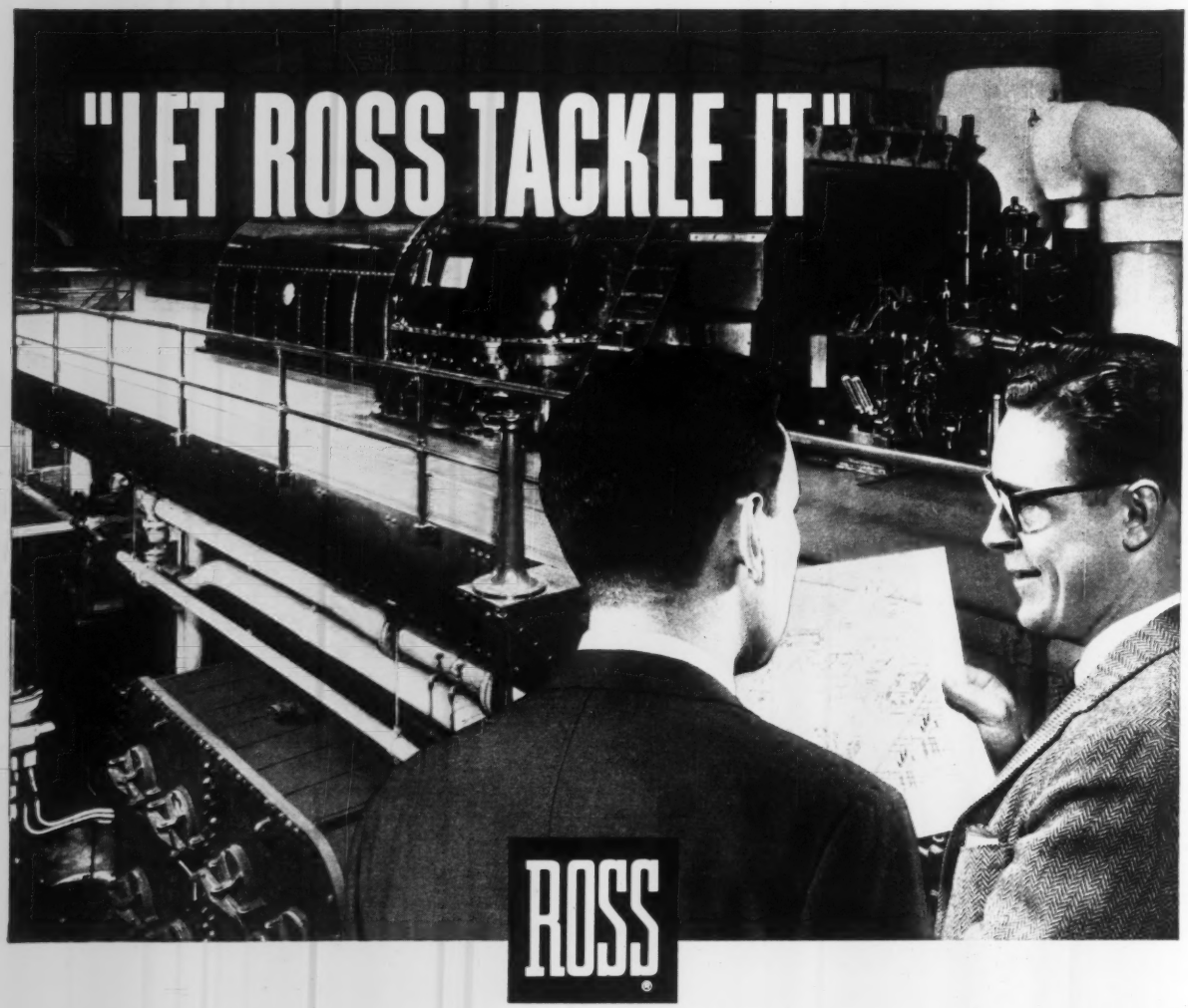
Sharon makes a complete line of chrome, chrome-nickel, chrome-manganese stainless, spring and high carbon, high tensile, coated, silicon—or any special alloy—open hearth or electric furnace, of any surface pattern, including the new rolled-in designs.

If you haven't already discovered this outstanding source of specialty steels, or the significance of Sharon Quality, make it a point to talk with a Sharon salesman at your first opportunity.

SHARONSTEEL

SHARON STEEL CORP.

SHARON, PENNSYLVANIA



"they've got the top engineering talent in the heat transfer business"

At Ross, engineering always comes first. Better design, better construction, better performance are uppermost. That's why all types of companies look to Ross for the most practical solution to *any* heat transfer problem.

For more than 40 years, engineers have been shaping policy and directing operations . . . in production, design, research, marketing, sales, purchasing. Today, Ross has the finest team of heat transfer experts in the business . . . men who are ready to focus their attention on special as well as routine assignments.

A Division of American-Standard*, Ross Heat Exchanger is equipped to meet *all* of your heat transfer requirements . . . regardless of size and quantity. Recently, manufacturing facilities were doubled with the opening of a large new plant devoted exclusively to heavy equipment, such as specially engineered exchangers and condensers. With the original plant turning out small, standardized units, Ross has now become even more specialized in producing industry's most complete line of heat transfer equipment.

The next time you have *any* kind of a heat transfer problem, *let Ross tackle it.* Meanwhile, get more facts on how Ross can custom build or mass produce exactly what you need. Write for new illustrated booklet: "THIS IS ROSS — READY FOR YOU."

American-Standard, Ross Heat Exchanger Division, Buffalo 5, N. Y. In Canada: American-Standard Products (Canada) Limited, Station D, Toronto, Ont.

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American-Standard Products

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ROSS HEAT EXCHANGER DIVISION

GUARANTEED PURITY!

Argon of 99.995% minimum purity

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The inert argon welding gas you get from LINDE is now *guaranteed** to contain *less than 50 parts per million* of impurities. And it's LINDE's regular industrial argon—not a special, extra-cost grade. You get this extremely high purity *on delivery* to you, regardless of the way the argon is delivered.

LINDE's 50 years of experience in producing gases of extremely high purity make this assurance possible. You can depend on LINDE *consistently* for the highest possible purity in the gases you use. LINDE COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y. Offices in other principal cities. *In Canada:* Linde Company, Division of Union Carbide Canada Limited.

*LINDE argon delivered as a liquid is the purest inert gas on earth. Guaranteed to contain less than 50 parts per million of impurities, LINDE liquid argon contains, on the average, less than ½ of this amount and practically no moisture.

For Argon of guaranteed highest purity . . . call LINDE!

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Allison-Campbell

ABRASIVE CUTTING KNOW-HOW

ACCO for Better Values

WHEEL EDGES TELL THE STORY!

NORMAL · *The right abrasive cutting wheel, properly applied, produces edges like these:*

Slightly rounded edge is a sign of the right wheel properly applied to the cutting of solid bar stock up to 12 inches square. You'll get fast cutting and long wheel-life with the right abrasive cutting wheel.

A wheel which retains its **square edge** is well-suited to cutting both—solids, and structurals or tubing of medium wall thickness. A good general-purpose wheel is required for these mixed cutting operations.

This **edge** is **slightly concave.** It should appear this way when you've used the right wheel to cut light tubing or other thin-wall sections. ALLISON wheels designed for this application make burr negligible.

ABNORMAL · *The wrong wheel, or improper application, produces edges like these:*

A **slightly pointed edge** means a wheel mismatched to the cutting job. A wheel which looks like this is too hard, doesn't break down uniformly. The tapering effect can produce wheel binding and breakage, and can burn the cut.

A "**chisel**" **edge** shows uneven wear, faster breakdown of the wheel on one side than on the other. It's the result of improper application of coolant in wet cutting. The result—shorter wheel life, and crooked cuts.

When the abrasive grain on the wheel edge wears smooth without being torn out, the **edge** becomes "**glazed,**" and the wheel loses its cutting efficiency. This condition is easily avoided by proper wheel application.

Abrasive Cutting Can Give You CLEANER Cuts—Faster

Cutting speeds of a few seconds per square inch, on almost *any* material, mean substantial time savings. Even titanium can be cut quickly and economically with the right abrasive cutting machine and wheel.

Fine finish obtained from abrasive cutting avoids burn, minimizes burr, and reduces or eliminates additional finishing operations.

Accuracy of CAMPBELL machines permits cutting within the closest tolerances, reduces rejects and scrap loss.

A complete selection of machines and wheels for *any* cut-off application is offered by ALLISON-CAMPBELL. Four types of CAMPBELL machines—chop stroke, oscillating, horizontal, and rotary—in capacities from the smallest stock to 14″ rounds . . . billets up to 12″ square . . . plate up to 6″ thick and 20 ft. long. ALLISON wheels—more than 150 different specifications—rubber or resinoid bond—3″ to 34″ diameters—.006″ to 3/16″ thick.

Application help is available from your ALLISON-CAMPBELL Field Engineer. His know-how is your assurance of the efficient, accurate, and economical cutting you can expect from modern abrasive cutting techniques. Call on him for expert advice.

WRITE FOR NEW BULLETIN

ALLISON-CAMPBELL Division has a modern, fully equipped Demonstration Laboratory in which your own cutting problems can be analyzed. Write for a copy of DH-20, a new bulletin describing these services. Details on ALLISON Abrasive Cutting Wheels and CAMPBELL Machines are also available.

ALLISON-CAMPBELL DIVISION
AMERICAN CHAIN & CABLE

921 Connecticut Avenue, Bridgeport 2, Conn.

ACCO TRADE MARK

Specialties of the House

ROEBLING is a specialist in galvanizing, with practically unmatched facilities for producing galvanized wire in enormous quantities and in complete size ranges. Hot galvanized is available in sizes from .283″ to .035″. . . Roegal (drawn galvanized) from .187″ to .005″.

You *pay* for the best when you buy galvanized wire. Make sure you *get* it—specify Roebling! Write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, N. J.

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Branch Offices in Principal Cities
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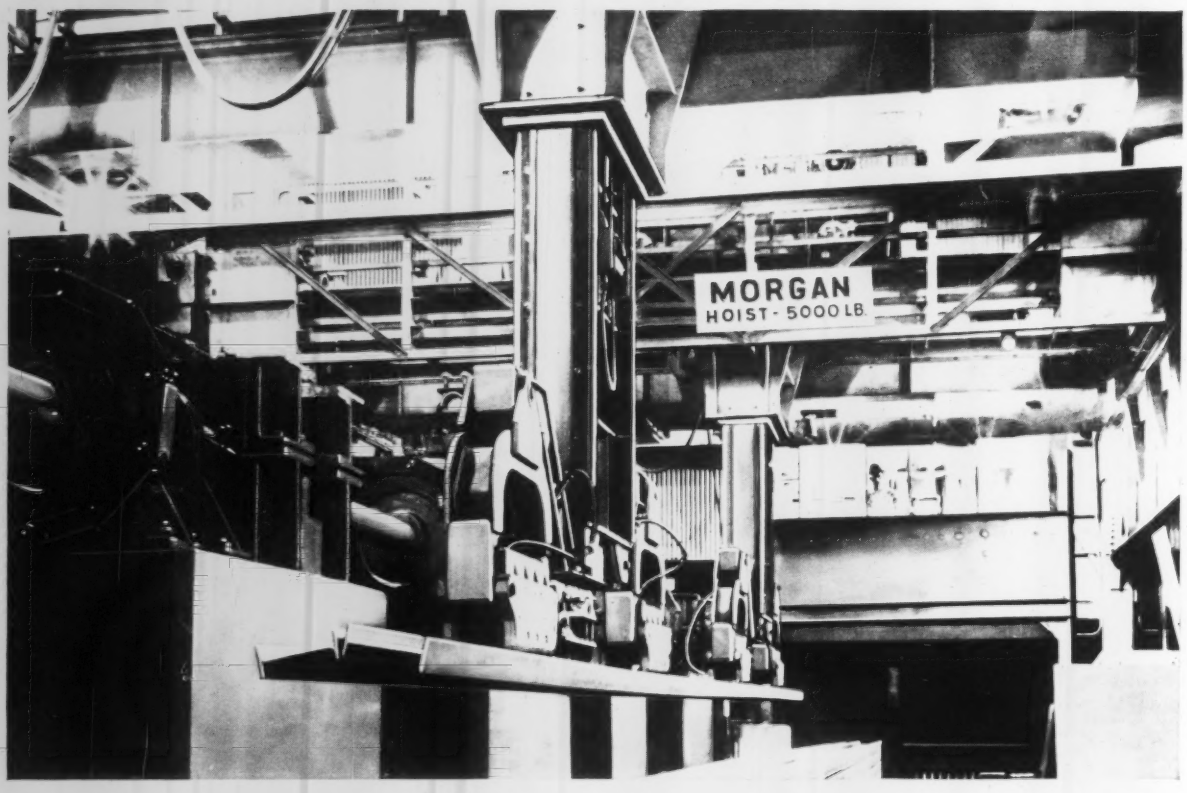
Roebling... Your Product is Better for it



Another steel-handling bottleneck broken

. . . by Morgan cranes and mill machinery

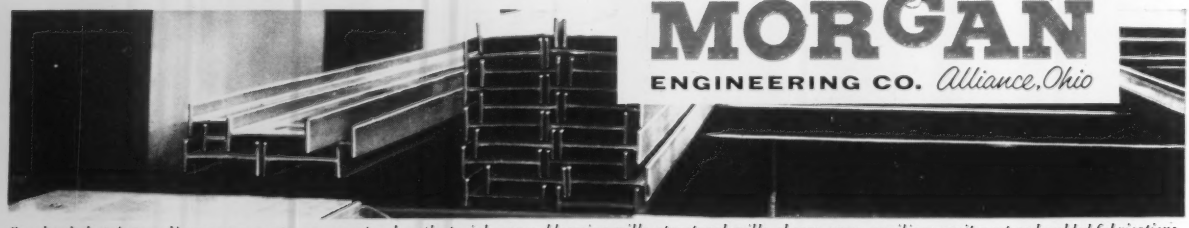
Now beams can be classified and nested with continuous flow production efficiency . . . and basic components of the system can be profitably applied to handling plates and slabs. Morgan Engineering designed and built the equipment that provides important savings by reducing manual operations and use of a crane withdrawn from normal service.

Beams move from the finishing line on a Morgan roller table and transfer chain assembly. Then they are stacked-to-order on a lower-level platform by the piler cranes.

Two Morgan beam piler cranes, synchronized to work in tandem, handle beams up to 70 feet long . . . *one* or *two* at a time. Cranes can also be used singly for handling shorter beams. The lower-level transfer chain platform carries stacked beams to position for movement to shipping or storage areas.

Cost-cutting automation and complete dependability are prime requisites for new steel-handling machinery *of all kinds*. Today's needs are met . . . and tomorrow's are anticipated . . . in Morgan equipment. Let Morgan Engineering help you reduce *your* production costs by applying our 90 years' experience in designing and building better cranes and mill machinery.

ELECTRIC OVERHEAD CRANE INSTITUTE MEMBER EOCI



THE MORGAN ENGINEERING CO. Alliance, Ohio

Overhead electric traveling cranes, gantry cranes, open hearth special cranes, blooming mills, structural mills, shears, saws, auxiliary equipment and welded fabrications.

When you need

a tough fan for a tough job...

INDUSTRIAL PROCESSES

BOILER GAS RECIRCULATION

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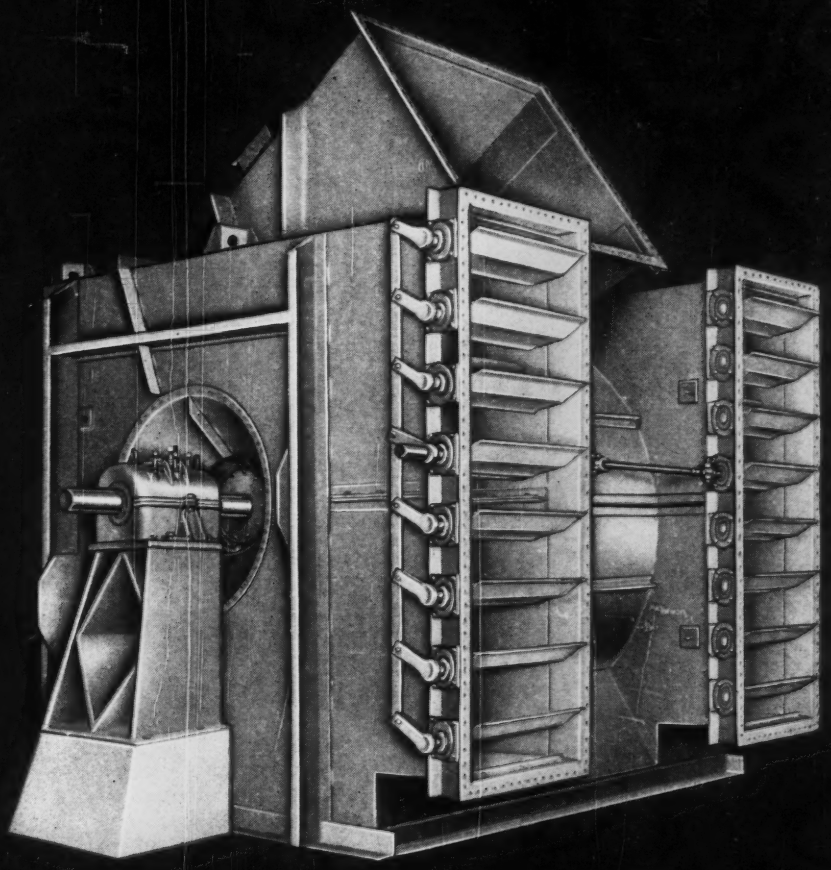


Westinghouse offers you a Heavy-Duty Fan... the right type...the right size...the right blading

Remember this: American Industry invests more in Westinghouse Heavy-Duty Fans than in any other.

Call your nearest Sturtevant Division Sales Engineer, or write Westinghouse Electric Corporation, Dept. D-11, Hyde Park, Boston 36, Massachusetts.

J-80662

YOU CAN BE SURE...IF IT'S Westinghouse

N. Y. Daily News Photo

New York's famous Coney Island boardwalk has undergone many changes in the last 35 years, but its old-time lampposts remain.

Corrosion-resisting Monel fastenings have held Coney Island lampposts securely for a generation.

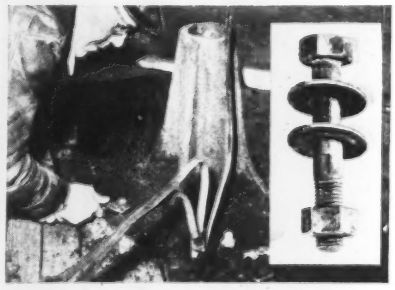
35 years in salt and storm throw light on a common fastening problem

One of the lampposts on Coney Island's boardwalk was taken down recently . . . Inside its base, a three-inch layer of rust flakes. Under the rust, four Monel* nickel-copper alloy bolts and nuts, holding the post tightly to the boards.

Threads were as clean and sharp as new. An easy twist with a pliers, and out came each Monel fastening — as fit as the day it had been put in! (see photo at right)

Salt corrosion is just one of the tough operating conditions Inco Nickel Alloy fastenings and other parts meet successfully. They do outstanding service under conditions of cyclic stress . . . high and low temperature . . . acid, alkaline attack. Selecting a metal to overcome conditions like these? Get Inco's handy guide — "Standard Alloys for Special Problems" — yours for the asking. *Registered trademark

The International Nickel Company, Inc.
67 Wall Street New York 5, N. Y.



Bolt, nut, washers are still in excellent shape, little corroded after their long service.

INCO NICKEL ALLOYS

NICKEL ALLOYS PERFORM BETTER LONGER

Steel Earnings Skid in First Quarter

The recession's toll shows clearly in first quarter reports of steel companies (1958, vs. 1957 net earnings for January, February, and March): Republic Steel Corp.—$8.6 million, vs. $28.1 million; National Steel Corp.—$3.8 million, vs. $13.5 million; Youngstown Sheet & Tube Co.—$3.6 million, vs. $10.6 million; Colorado Fuel & Iron Corp.—$1.4 million (loss), vs. $4.6 million (profit); Kaiser Steel Corp.—$1.7 million, vs. $7.8 million; Crucible Steel Co. of America—$172,000, vs. $3.4 million; Alan Wood Steel Co.—$33,000, vs. $899,000; Lukens Steel Co.—$1.5 million, vs. $3.4 million; Lone Star Steel Co.—$483,000, vs. $3.3 million; Continental Steel Corp.—$581,000, vs. $662,000.

U. S. Pricing Itself out of World Markets?

American workmen are pricing themselves out of the market in the face of rising competition from foreign countries, says Roger M. Blough, U. S. Steel Corp. chairman. Charging that tariffs and similar expedients provide no permanent solution, he says: "Sooner or later we will have to face up to one undeniable fact—that America is costing itself out of the market. When those who profess to speak in the interest of the American workingman advocate raising wage costs as a means of increasing consumer purchasing power, they are perpetrating what is the most dangerous hoax of our times."

Ruttenberg: Steel Wage-Price Freeze

The 20-cent-an-hour increase in wage costs scheduled for this coming July 1 in steel should be postponed until July 1, 1959. The present wage contract scheduled to expire next year should be extended to July 1, 1960. Current posted steel prices should be extended to July 1, 1960. Those are the proposals of Harold J. Ruttenberg, president of Stardrill-Keystone Co., Beaver Falls, Pa., and former United Steelworker official. The union has already gone on record against such a freeze in contract terms. Steel companies have not committed themselves on prices.

UAW Goes into the Red

The United Auto Workers shows nearly a $500,000 deficit in its general fund for January and February. More losses are expected when March and April operating expenses are totaled. An estimated 450,000 UAW members are out of work and not paying dues. That means the union will have to borrow to pay its way this year, particularly if it expects to use its strike fund which is not growing as rapidly as anticipated.

Strike Fund Buildup Lags

Even with its special monthly assessment of $5 per man during the second quarter to bolster the UAW strike fund, that account will be nowhere near the goal of $50 million by the end of May. It stood at $24 million on Feb.

28. If an auto strike is called (STEEL odds are 4 to 3 against it), the union will have to borrow up to $20 million to finance it.

Chrysler May Revamp Divisional Setup

Faltering sales and high administrative costs may force Chrysler Corp. to form a single division from its De Soto, Chrysler, and Dodge units. Speculation is strengthened by the announcement that De Soto body and assembly work will be done in Chrysler Div. plants starting with the '59 model run. Its Firesweep series is being built in the Dodge plant now. The firm is taking about 14.5 per cent of the industry sales, vs. almost 20 per cent a year ago.

GNP To Hit $425 Billion in '58

Look for the gross national product to come to about $425 billion in 1958. It was at an annual rate of $424 billion in the first quarter. GNP was $434.5 billion in 1957.

Canada Parallels U.S.

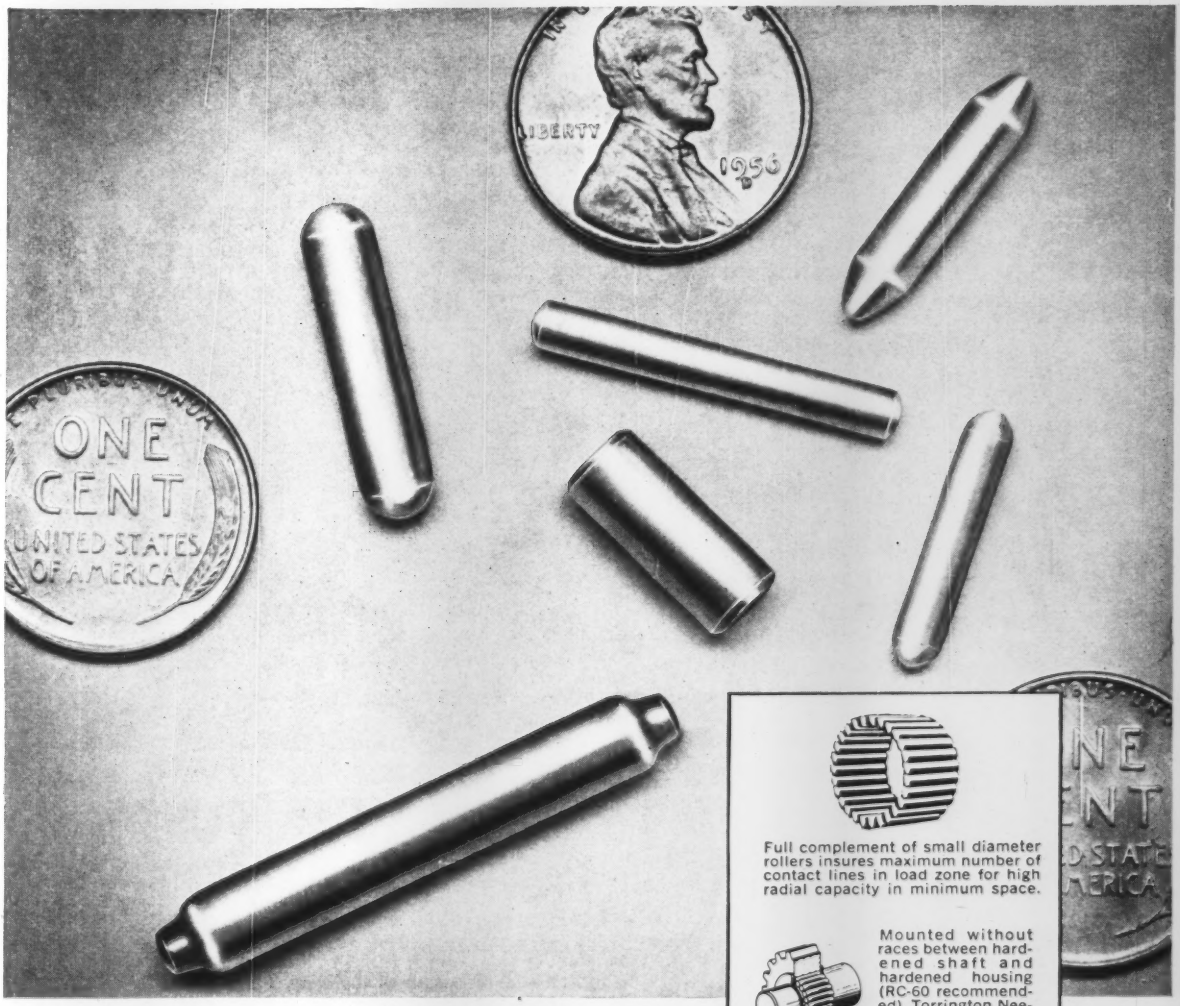
Significant and widespread upturns in any quarter of 1958 are unlikely in either the U. S. or Canada, believes Norris R. Crump, president of Canadian Pacific Railroad. A Canadian Pacific study indicates the U. S. will recover early next year, and Canada will follow by a few months.

Railroads Balk at U.S. Plan, but—

Although the railroads don't like the government's proposal for financial aid, it's better than nothing. They'll settle for it because Congress won't accept their excise tax cut and other proposals. The main features of the U. S. plan: 1. Guarantees by Uncle Sam of five-year private loans up to $500 million for the purchase of capital equipment other than rolling stock. 2. Guarantees of loans totaling $200 million for 10 per cent of the purchase price of freight cars. 3. Revamped Interstate Commerce Commission jurisdiction, so that roads can more easily drop losing business, such as commuter runs. 4. Revised ratemaking policies by the ICC, so that railroads can more easily meet competition.

Straws in the Wind

Armco, which acquires National Supply Co. as a subsidiary on Apr. 30, will share with Republic Steel the ownership of Fretz-Moon Tube Co. Inc., a Butler, Pa., buttweld pipe producer. It was formerly owned jointly by National Supply and Republic . . . Studebaker-Packard Corp.'s first quarter production is less than 1 per cent of the industry's output, compared with 1.07 per cent in 1957 . . . American Motors Corp. will boost Rambler assemblies from 660 to 700 a day . . . Texas Instruments will cut entertainment type transistor prices 5 to 25 per cent on May 1 . . . New Jersey Zinc Co. will close down its Hanover, N. Mex., mine on May 1 and discontinue roasting operations at Canon City, Colo., on May 15 . . . March living costs jumped 0.7 per cent to a record 123.3 per cent of the 1947-49 average . . . Ralph J. Cordiner becomes chairman and remains the chief executive of General Electric Co.; Robert Paxton becomes president.



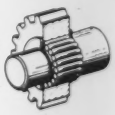
Now you can get highest capacity at lowest cost with Torrington Needle Rollers

A hardened shaft, a hardened housing, and precision Torrington Needle Rollers provide the most economical, highest capacity anti-friction assembly you can obtain.

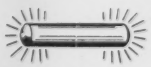
Six roller end shapes permit design flexibility whether the requirement be maximum effective roller length, proper fillet clearances or greater lip retainment. Torrington Needle Rollers are available in a complete line meeting SAE and AFBMA specifications. Torrington standards for material, heat treat, tolerance and finish of Needle Rollers are the highest in the industry.

Operating results with Needle Rollers depend on careful design of mating parts. Torrington's Engineering Department, with extensive experience in Needle Roller application, will be glad to give you technical advice on your needs. *The Torrington Company*, Torrington, Conn.—and South Bend 21, Ind.

Full complement of small diameter rollers insures maximum number of contact lines in load zone for high radial capacity in minimum space.



Mounted without races between hardened shaft and hardened housing (RC-60 recommended), Torrington Needle Rollers allow largest possible shaft diameters.



Carefully hardened, ground and lapped high carbon chrome steel makes each Torrington Needle Roller a precision part for long life performance.

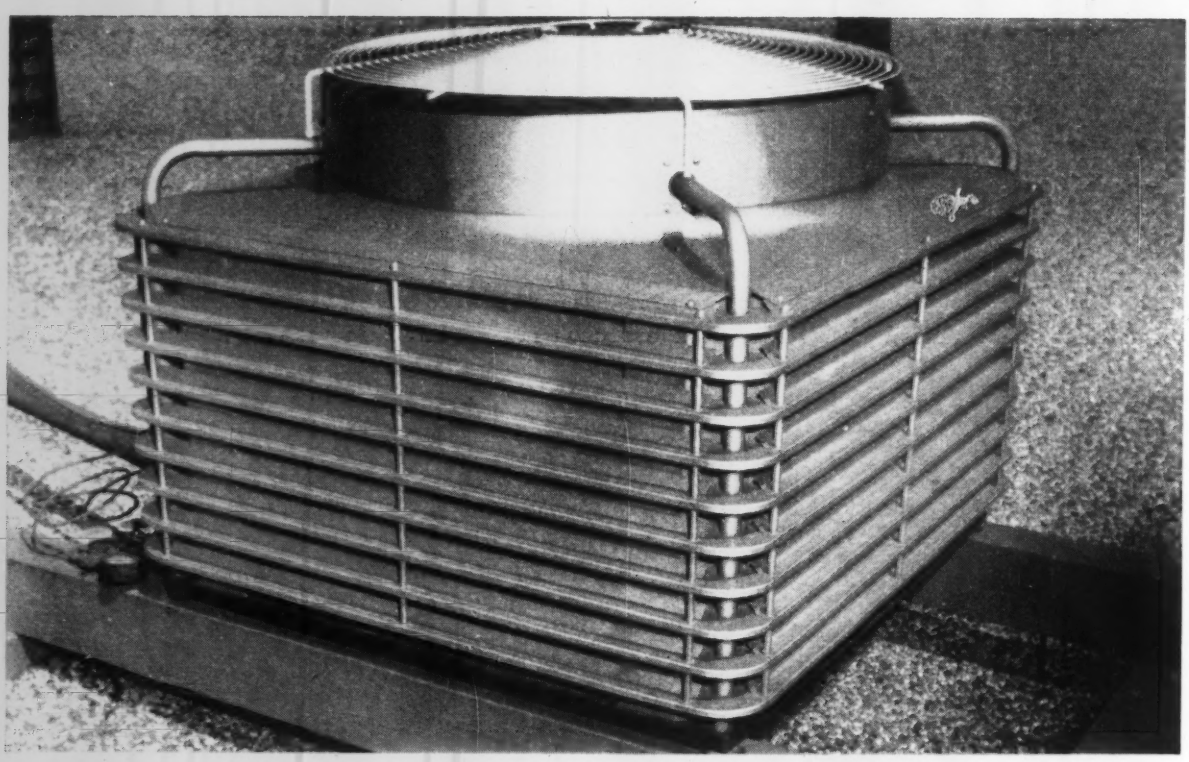
Close tolerances are assured by stringent quality controls. Standard OD tolerance is .0002", but Torrington Needle Rollers can be supplied with tolerance of .00005". Tolerance on length depends on end shape.

Fine finish reduces friction to a minimum. Torrington Needle Rollers are usually polished to 4-6 rms, but finishes as fine as 1-3 are available on special order.

TORRINGTON BEARINGS

District Offices and Distributors in Principal Cities of United States and Canada

NEEDLE • SPHERICAL ROLLER • TAPERED ROLLER • CYLINDRICAL ROLLER • BALL • NEEDLE ROLLERS • THRUST



How Armco ALUMINIZED STEEL Type 2 Cut Costs and Improved Durability of Air Conditioner Housing

Special hot-dip aluminum-coated steel provides low-cost resistance to atmospheric corrosion, eliminates need for paint

A leading manufacturer of air conditioners formerly made the housings for the condenser units from cold-rolled steel. They had to be painted inside and out for surface protection and good appearance. Now, with all sheet metal parts made of Armco ALUMINIZED STEEL Type 2, *only the outside* is painted—and that because of a color identification of long standing.

Production Costs Down

Elimination of paint on the inside of the housing has reduced paint and labor costs 50%. And shop men report that with moderate care, parts can be fabricated of ALUMINIZED STEEL just as easily as with uncoated steel.

Better Durability

Originally the decision to use ALUMINIZED STEEL was based on tests which showed no rusting after 15 years' continuous exposure in an industrial atmosphere. Now service records prove that even under severe conditions the ALUMINIZED STEEL housings have lasting resistance to rust and corrosion, provide much longer service life.

Save on *your* production costs and give your outdoor products customer-attracting durability with the multiple advantages of Armco ALUMINIZED STEEL Type 2. Just fill out and mail the coupon for complete information.

ARMCO STEEL CORPORATION
1628 Curtis Street, Middletown, Ohio

Send me design and fabrication information on Armco ALUMINIZED STEEL Type 2.

We are considering it for_____

NAME_____

COMPANY_____

STREET_____

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ARMCO STEEL

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SHEFFIELD DIVISION • ARMCO DRAINAGE & METAL PRODUCTS, INC. • THE ARMCO INTERNATIONAL CORPORATION

Time Well Spent

How much time should management spend on community activities?

Admittedly, there is no easy answer to the problem, but we heartily endorse the views of William J. Sampson Jr. Mr. Sampson has been president of American Welding & Mfg. Co. for 16 years. The Warren, Ohio, firm (which is in a community of about 60,000) employs 1000.

Here's how Bill Sampson states his case:

"When I took over the job, I thought I could devote my entire time to making a success of an enterprise. But to my dismay, I found community activities more and more demanding.

"It was impossible to ignore the demands. They were entirely proper. As the executive head of a local enterprise, it was part of my responsibility to carry my fair share of the burden of local affairs.

"As time went on, I found myself 'suckered into' Community Chest, Junior Achievement, Heart Association, YWCA, Chamber of Commerce, and other community affairs. On top of that, I was practically drafted to head up the Industrial Information Institute, whose purpose is to educate all the people of our community on basic economic facts and the American enterprise system.

"All this was interesting, but it interfered with business and cut into my family life. It was tempting to feel sorry for myself. I reconciled myself by saying that it was the penalty for being a company president. The rest of the outfit doesn't have to pay that sort of penalty.

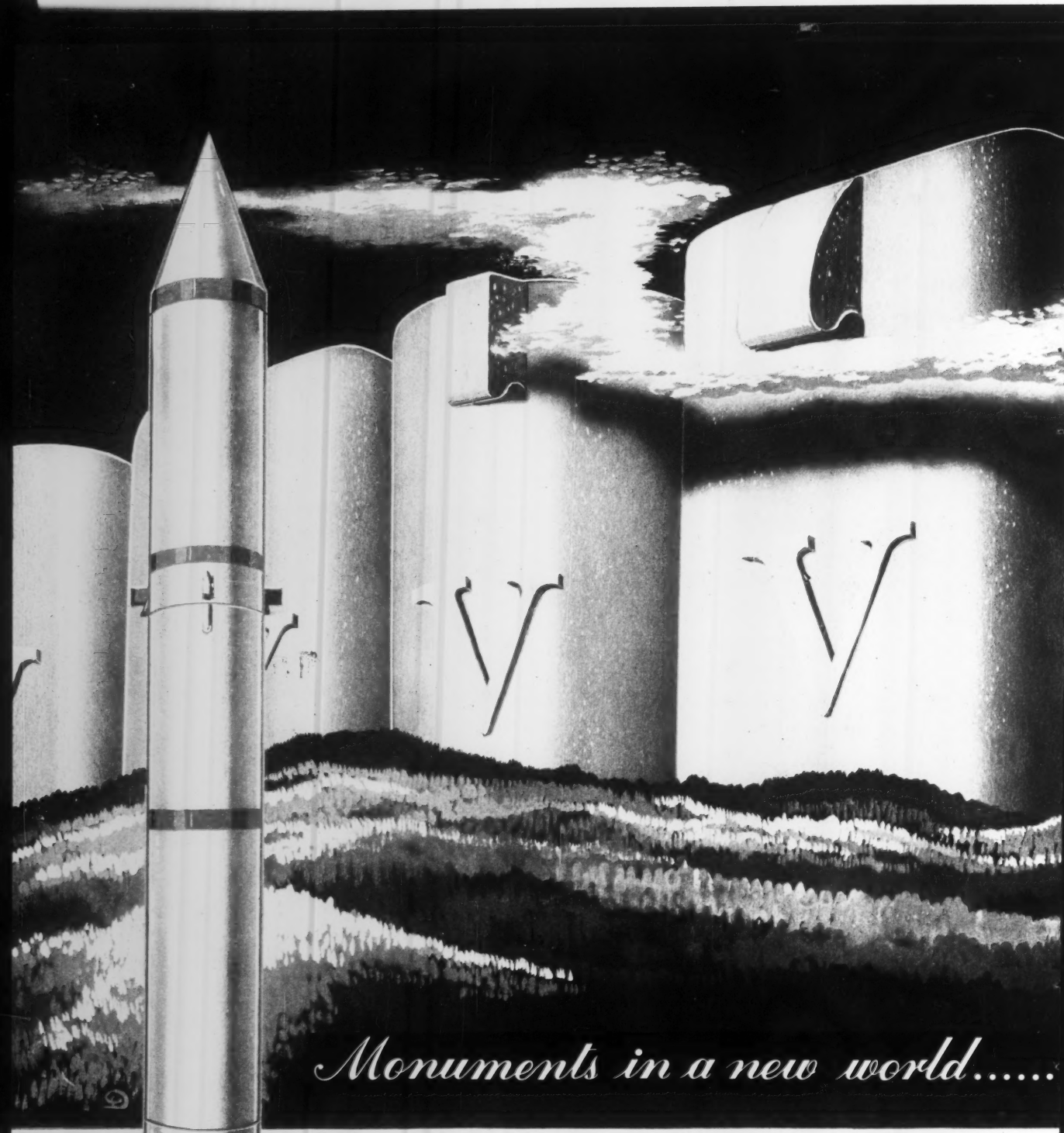
"But in checking around I found that the sales manager, advertising manager, production department heads, production people, inspectors, machine operators, plant guards, and office girls were doing pretty much the same sort of thing.

"Finally, it dawned that what was expected of me as the president of my company was only a reflection of the extent to which civic activities had been undertaken voluntarily by practically all the people within the organization.

"True, all sorts of community projects that take more time than can possibly be spared still catch me, and I still fuss about it. But I wouldn't have it any other way. I am simply carrying through the same measure of community responsibility that the other people in our company are carrying through in their jobs; and that is the way I think it should be."

Irwin H. Such

EDITOR-IN-CHIEF



Valley ingot moulds are designed for individual steel plant conditions. These moulds meet today's metallurgical requirements

VALLEY MOULD AND IRON CORPORATION

GENERAL OFFICES: HUBBARD, OHIO

Western Office: Chicago, Illinois. Northern Office: Cleveland, Ohio

FIGHT ON RECESSION

Will You Join Us?

A BOLD yet simple program to correct the recession and to halt the march of inflation is proposed by the editors of STEEL on the following pages. It is based on these facts:

- **The recession got its start (and has its deepest roots) in the capital goods industries.**
- **Capital goods dollars have more bounce than soft goods and service dollars.**
- **The quickest, surest way to correct the recession is to stimulate spending for capital goods —spending for re-equipment and, where needed, spending for new plants.**
- **The most direct method to encourage spending for tools is to free industry from our strait jacket depreciation laws.**

STEEL's program has only two steps:

- **For the short term, allow any equipment, building, or land acquired from Jan. 1, 1958, until June 30, 1959, to be amortized for tax purposes in five years—if the owner elects to do so.**
- **For the long pull, set up an industry-government commission to modernize the depreciation setup on a permanent basis.**

The program has its genesis in letters and conversations with our readers. Scores of you who are participating in this publication's Cost Crisis Competition (its aim: the updating of capacity and equipment to lower unit production costs) have suggested that depreciation reform is essential to keeping our industrial machine modern.

You have said that investment triggered by liberalized depreciation will do more to regain high-level employment and output than any stopgap measure aimed at putting more dollars into the consumer's pockets. You have pointed out that the updating of our industrial machines (as opposed to outright expansion) is an immediate need in slenderizing costs, boosting output per manhour of labor input, and holding down prices.

We realize that one publication alone—or one company or one industry alone—cannot overcome the inertia that is blocking depreciation reform. Pleas made in the past by industry and publications—in editorials, in speeches, in corporate reports, in testimony before Congressional committees—have been like drops of water falling on the desert. They have evaporated before they could form a reservoir to build up enough pressure to get action.

With the nation groping anxiously for a way to stem the recession, we believe the time for concerted action is now.

In the weeks ahead, the editors of STEEL will continue to spearhead the drive for short and long term depreciation reform. Our voice will reach all congressmen and appropriate government officials.

Will you join us in the fight?

Walter J Campbell

EDITOR

Depreciation Article Follows.

Tale of the Million Dollar

HOW DOES our present depreciation system penalize industry? Thompson Products Inc.'s tale of the million dollar turret lathe bears repeating because it's becoming a classic.

In 1942, Tapco bought a Warner & Swasey 3-A saddle-type turret lathe for $12,000. Federal tax laws permitted the company to depreciate the original cost over 14 years.

In 1956, the lathe became obsolete. It had a resale value of $1000, and the company had $12,000 to add to that with which to buy a replacement.

But the replacement cost in 1956 was $35,000 for a lathe that would perform the same functions as the old one, or $67,000 for a new one with attachments to meet today's more exacting needs.

Thompson had only $13,000 to do a $67,000 job. The difference of $54,000 had to come out of profits. To get that amount in 1956, the company had to earn a profit of more than $112,500 before taxes because $54,000 was all there was left after the government took its corporate profit tax of 52 per cent.

And to earn that profit, the company had to sell more than $1,250,000 worth of products. Hence, the million-dollar turret lathe.

Let's Leap to Recovery with Bold Action

THE U. S. can take a giant step toward halting the recession and checking inflation with this two-point program:

1. Allow any equipment, building, or land acquired from Jan. 1, 1958, until June 30, 1959, to be amortized for tax purposes in five years, if the owner elects to do so. (Congress should enact the enabling legislation now.)

2. Appoint a government-industry committee (like President Eisenhower's commission on foreign trade policy) to study what can be done for permanent depreciation reform. A new system should be ready to go into effect July 1, 1959. We must abandon the government's rigid concept of useful lives for facilities, as embodied in the Internal Revenue Service's Bulletin F. Recommended is the adoption of a bracket system, advanced by the National Machine Tool Builders' Association and following somewhat the Canadian pattern which is working so well. Adopted in 1949, it has withstood the test of nine years' use.

Immediate Relief

We have, in effect, declared depreciation moratoriums twice before —in 1940 and in 1950 when five-year amortization was enacted. Both contributed immeasurably to the productivity and prosperity of those periods by stimulating capital expansion.

Today, the recession is caused primarily by a decline in capital spending. The recession has since fed on itself and has brought unemployment and other ramifications in virtually every segment of the economy. To get things going again, we have to move the capital equipment and industrial construction industries off dead center. It has been proved that moratoriums can provide such stimulation, by giving industry the impetus to buy facilities to make new or improved products at less cost.

Previous moratoriums were designed to increase capacity in times of war. Now we need more facilities that will cut costs so that American goods can be priced back into the domestic and world markets.

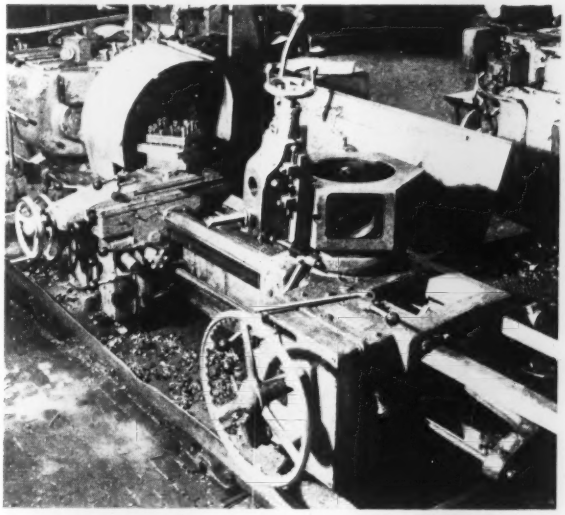
We need the moratorium in the battle against inflation. Increased productivity is the most effective way to combat it. And the most effective way to make significant gains in productivity is through improved equipment.

Thus a moratorium on our strait jacket depreciation rules that force much of industry to write off its equipment in 20 years and its buildings in 40 to 60 years would stimulate the basic capital equipment and industrial construction industries. That would strike at the core of the recession. Re-equipment boosts productivity and lowers costs. That would strike at the core of inflation.

Sentiment is rising for a temporary return to fast amortization. Rep. Edgar W. Hiestand (R., Calif.) has just introduced HR 11863 which would return five-year writeoffs for 1958. Herbert I. Segal, president, Van Norman Industries Inc., New York, suggests its return as part of his program

Turret Lathe

THE OLD



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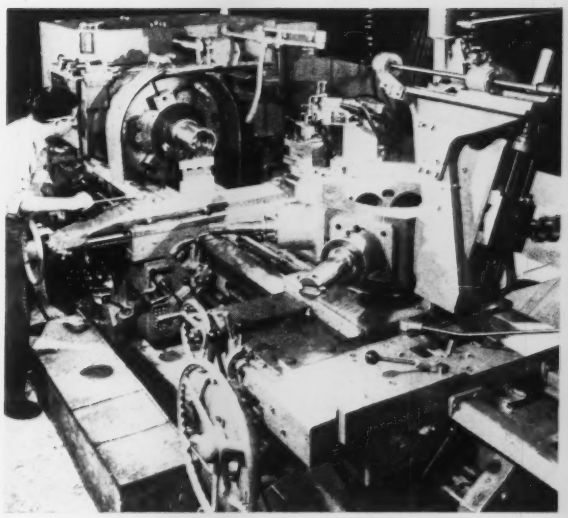


on Depreciation

for recovery. J. A. Swaney, assistant to the treasurer at Harris-Intertype Corp., Cleveland, believes it would be a godsend to the printing and printing equipment industries.

Long Term Catalyst

We need a permanent depreciation policy that is sane. Ours is the most archaic among industrial nations of the world.

Standard machine tools are usually depreciated over a 15 to 25 year span in America. In Canada, the depreciable life normally allowed for machine tools is five years. In England, it's about eight; in West Germany, it's not over ten; in France, it's six or seven; in Italy, it's seven; in Switzerland, it's about eight; in Sweden, it's five for machines acquired after 1952 and at the discretion of the taxpayer on what was acquired before then.

A President's commission on depreciation would have scores of reform proposals to study, plus plans in other nations, virtually all of which are more liberal than ours.

Useful Lives

America's depreciation ills stem primarily from two sources—from the rigid concept of useful lives for facilities and from inflation. A solution that attacks the first problem will probably help with the second because more flexible and liberal schedules of useful lives will allow more rapid writeoffs. The faster the amortization the less chance for inflation.

That's why the majority of depreciation experts interviewed by STEEL agree with E. F. Gibian, staff director for industrial engineering at Thompson Products Inc., Cleveland: We should tackle the useful-life problem first. Proposals that aim at both get complicated and have less chance of Congressional acceptance.

STEEL prefers the bracket approach as the solution to the useful-life difficulty. It's simple. It follows generally the system working so successfully in Canada and other nations. It already has the backing of powerful groups such as the tool builders.

Under it, the limited physical life concept would be scrapped. "Even the most expert machine tool builders and engineers could not compile a list of average lives for every machine tool that would be meaningful," says Jerome A. Raterman, president of Monarch Machine Tool Co.

The multitude of confusing Internal Revenue Service schedules in Bulletin F, with its requirements of salvage and residual values, is a unique American phenomenon. No important foreign country uses them, nor does any other country make the computation so difficult, arbitrary, and inequitable.

NMTBA proposes that Bulletin F should simply be a statement of policy and practice which would properly recognize obsolescence. The 1920 and 1931 editions of Bulletin F followed that pattern—giving the principles to be considered in the estimation of useful lives. Detailed schedules had been published separately but were not in-

Canada Plans Depreciation

Many countries have more liberal tax depreciation rules and laws than the U. S. Canada divides assets into 14 classes. All property in each may be written off up to the maximum rate indicated for the category. If the taxpayer wants to, he can make no claim for depreciation in one year or he can vary the amount claimed from year to year (provided he doesn't go over the maximum). The declining balance method of figuring amortization is allowed. Here are some sample maximum rates for annual writeoff:

Item	Class	Rate
Boilers for manufacturing	8	20%
Contractors' movable equipment	10	30
Dies	12	100
Electric generating equipment (auxiliary)	9	25
Electric wiring for equipment	8	20
General machinery (not otherwise specified)	8	20
Jigs	12	100
Oil burners for manufacturing	8	20
Patterns	12	100
Radar and radio equipment	9	25
Storage tanks for oil or water	6	10
Tractors, trailers, trucks	10	30

Source: Canadian Tax Foundation.

corporated into the bulletin itself until the 1942 edition.

Instead of the detailed, obscure schedules, brackets of useful lives would be set up, within which the user could select his own writeoff period. For machine tools and comparable productive equiment, the brackets would be seven to ten years; for buildings, 20 to 30 years; for short-lived facilities, such as cars and trucks, the present three to five year bracket. The bracket idea parallels the Canadian system which sets maximum rates for 14 general classifications of facilities.

If the user is within the brackets, the IRS would not challenge him. However, if he tried to go below the brackets—three years, say, for a machine tool—he would have the burden of proving that as a reasonable period.

Greater flexibility in our depreciation laws would allow for a new factor influencing obsolescence today. Listen to Roger W. Bolz, editor of *Automation*: "There is a growing need with automation to consider entire production lines, or plants, as expendable tooling, useful only for the short duration of effective product sales life. Automation equipment, unlike machinery in past years, is often of no value for economically turning out products other than those for which it was designed."

Hear a maker of automation equipment, Frank White, president of Automation Development Corp., Willoughby, Ohio: "Under the ideal depreciation setup, equipment should be written off as an expendable item in relation to the life of the product it makes. Since we don't have that, many of our customers, in effect, keep double records—one for slow tax depreciation purposes and one for their own information on how long the machine will be useful to them."

But not every company will bother with double records. Because of our horse-and-buggy depreciation laws, much of industry tends to re-equip on a horse-and-buggy basis to conform with Bulletin F's schedule of useful lives. Many companies tend to buy new equipment only when their old has been fully or nearly fully written off for tax purposes. Depreciation reform will get around that industrial prejudice and stimulate much of metalworking to re-equip on a more realistic basis.

Inflation

Many proposals for depreciation reform aim primarily at the inflation problem. Most embody some device to figure tax writeoffs on a replacement basis, rather than the traditional original cost approach. If depreciation on all industrial facilities were figured at current prices, Machinery & Allied Products Institute figures American industry this year would not be paying income taxes on $6 billion.

Congress can hardly be expected to accept depreciation on a replacement basis when the concept isn't generally accepted by industry or the accounting profession. One hope: A recent survey of businessmen and heads of business schools by the Institute of Certified Public Accountants shows 74 per cent favor shifting to the replacement method. Ten years ago, only 30 per cent advocated such a change.

The institute's committee on accounting procedures pretty much dictates accepted practices. Methods set forth in its bulletins are accepted, for example, by the Securities & Exchange Commission. The committee has had the matter of price-level adjustment of depreciation on its inactive agenda since the 1948 survey. At its June meeting, it will consider moving it to the active agenda. But even then, it might be a year or two before a bulletin is issued.

So, the time is closer (but not close enough) when we can at last persuade Congress to accept the replacement cost concept. STEEL believes the most workable proposal for the replacement concept is "reinvestment depreciation," which has many sponsors, including the steel industry. It applies

Rep. Edgar W. Hiestand (R., Calif.), author of H.R. 11863 (bill at right)

A Bill for Fast Tax Writeoffs

To provide that production machinery acquired during 1958 and used in a trade or business may be depreciated over a five-year period.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, that in the case of any production machinery—

(1) which is acquired by the taxpayer after Dec. 31, 1957, and before Jan. 1, 1959, and

(2) which is used in a trade or business of the taxpayer, at the election of the taxpayer, the useful life shall be treated for purposes of section 167 of the Internal Revenue Code of 1954 (relating to depreciation deduction) as 60 months.

SEC. 2: Gain from the sale or exchange of property, to the extent that the adjusted basis of such property is less than its adjusted basis determined without regard to the first section of this Act, shall be considered as gain from the sale or exchange of property which is neither a capital asset nor property described in section 1231 of the Internal Revenue Code of 1954 (relating to property used in the trade or business and involuntary conversions).

SEC. 3: This Act shall apply to taxable years ending after Dec. 31, 1957.

the LIFO concept of inventory accounting to capital spending. An index is applied to facilities to bring their value up to today's dollars. If the facilities are disposed of, the updated value may be credited to the depreciation account of the company in the year they were disposed of, if new facilities are installed to take their place.

Will Tax Revenue Be Lost?

We have had five-year amortization twice before, but it has been dropped twice on the grounds that it cost the government tax revenue. Evidence is to the contrary.

Corporate taxes hit $32.4 billion in the five years beginning in 1940 and $89.9 billion in the five years beginning in 1950. Up until that time, those were record or near-record receipts. Of course, tax rates were higher during most of those years than they are now, but the figures show there's little ground for worry about tax losses.

Canada, Britain, West Germany, France, Switzerland, and Sweden all have more liberal depreciation laws than we have. All have equally urgent tax revenue problems. But they're not killing the goose that lays taxable eggs. We are by excessively taxing income-producing equipment and buildings through our archaic depreciation setup.

More liberal amortization may defer taxes, but it does not forgive them. They will be paid eventually. By generating more prosperity, speedy writeoffs could conceivably increase taxes. In the long run, fast amortization now and more liberal permanent regulations beginning in 1959 will be cheaper for the U. S. than the tax cut proposals now being considered as antirecession remedies.

Conclusion

Needed is an imaginative approach to the depreciation problem. Bulletin F, with its physical lives based on the history of the 1930s and 1940s, is unfair and leads to interminable controversy between industry and government. Think of the savings in time and money to both if those unproductive arguments end! That aspect of the situation is bad enough. Another handicap is even worse. If we don't get a more constructive depreciation system, we'll be fatally handicapped in fighting inflation and achieving long term prosperity.

We have had capital expansion in the last decade partly because five-year amortization has given us a partial moratorium on our outmoded depreciation laws. But fast writeoffs were virtually killed last year by legislation sponsored by Sen. Harry Byrd (D., Va.). That has contributed to the capital goods recession, which is completely unmasking the deterrents and inequities of our depreciation system. What are we going to do about it?

STEEL's answer: Adopt a two-point program — return to fast amortization temporarily while an industry - government commission has time to forge a permanent, liberal depreciation system.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.*

Krafft Ehricke shows model of unmanned, three-stage supply ship needed to establish manned satellite in earth orbit

Timetable for Space

Probable Dates for Initial Capability	Project
1958-70	Operation and improvement of earth satellites.
1959-65	Satellites in earth-moon field, lunar satellites, lunar "bombardment."
1960-65	Lunar landing with automatic vehicles.
1960-65	Manned satellite rocket plane (either as temporary satellite or satelloid; manned re-entry tests with noncircular vehicles probably earlier).
1963-70*	Permanent inhabited space station.
1964-66	Manned flights around moon (chemical propellents feasible; advanced methods could be used if available).
1967-70	Manned lunar landing (possibly chemical-nuclear combination).
1970-75*	Lunar base.
1972-80*	First manned flights to neighboring planets, probably Venus and Mars (nuclear power or solar power is likely rather than chemical propulsion).

*Degree of effort depending on utility and urgency.
Source: Convair-Astronautics Div., General Dynamics Corp.

A Look at Metalworking's Space Markets

AMERICA is on the threshold of the space age. Within 20 years, men should be exploring Venus and Mars. We'll probably land a space vehicle on the moon by 1965 (see timetable). What will this new dimension in air travel mean to metalworking?

STEEL put that and other questions to three spacemen at Convair Div., General Dynamics Corp.: Krafft Ehricke, assistant to the technical director, and Abe Hurlich, engineering materials supervisor, Convair-Astronautics; and T. E. Piper, executive staff assistant for all of Convair. (The firm builds the Atlas and is a pioneer in space flight research.)

Here are their answers:

Q: How far along are we in the development of spacecraft?

A: (Ehricke) Right now there are earth-launched vehicles requiring powerful boosters. The first generation of boosters is under development in our ICBM and IRBM programs. Small, high performance upper stages are needed to launch space capsules into orbits around the earth, to the moon, and into the orbits of Venus and Mars. Those upper stages are the goal of present design and development.

But heavier boosters are needed to establish and supply large manned installations in space. Since there are few weapon applications for these craft, their development is being considered on the basis of astronautic requirements alone.

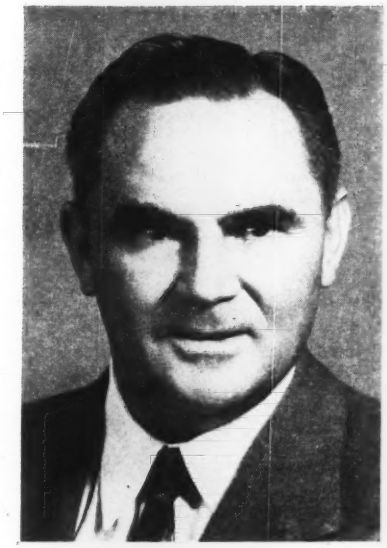
Present activity in manned space flight is concentrated on the X-15 (see STEEL, Mar. 31, p. 51). High-drag, manned re-entry capsules are an alternative.

Q: What's expected in the next 20 years?

A: (Ehricke) 1. Heavier satellites with optical equipment and/or recovery capability. 2. Moon probes. 3. Temporary manned orbital flights. 4. Interplanetary probes (see timetable).

Q: What metals will play the major role in spacecraft?

A: (Ehricke) Practically all materials used on earth could be used in space, except where hard radiation or unavoidable temperature variations between sunlight and shadow negatively affect properties. The bulk of materials will be used for tanks. They will be selected on the basis of the tankage (such as nitric acid and liquid hydrogen)



T. E. Piper believes exotic materials will play major role in space

and strength-weight considerations.

Metals that resist oxidation will probably find applications. So pure molybdenum could be used, as could tungsten tubing for hot (non-oxidizing) fluids.

(Piper) As an educated guess, we believe exotic materials will play a major role. It's likely that the space vehicle will be a composite of present materials, ceramics, and cermets.

Most promising are alloys of titanium - molybdenum, beryllium, and chromium. Cermets such as titanium carbide and chrome nickel carbide look promising as ablating materials (they melt at the surface and slough off, leaving a solid interior. They can be used for leading edges, nose cones, radomes, windshields, and other exterior surfaces.)

Abe Hurlich says space flight will put premium on high-strength materials

Exotic metals may also be used as coverings for skins made of such conventional materials as stainless steel. Or it's possible that high-temperature plastic laminates, combined with stainless steel and exotic materials, would be used as a heat blanket—plastic laminates would be the ablating material.

Certain silica oxides, as well as aluminum oxide and magnesium oxide ceramics, greatly extend components' chances for survival. Pure silica's resistance to high temperatures makes it useful for optical windows with potential temperatures of 3632° F or more. Perhaps silica will also be used for radomes and housings for other guidance and electronic gear.

Q: Will space flight require new alloys?

A: (Hurlich) Space flight puts a premium on high strength, low density materials. High-strength alloys of beryllium, titanium, magnesium, and aluminum, as well as ultra high strength steels, are of considerable interest. Development work on such alloys is in progress.

(Ehricke) Technologies likely to be affected include molybdenum, cermets, steels, and tungsten. Qualities of importance are high temperature resistance, low expansion coefficient (of re-entry structures), and resistance to oxidation while the vehicle is in the atmosphere.

Q: What type powerplant will propel spacecraft?

A: (Ehricke) Possibilities: 1. Chemical. 2. Nuclear-heated working fluid. 3. Solar-energized. 4. Ion rocket (later).

Q: What will the space age mean in terms of metal sales.

A: (Hurlich) It won't have a major impact on tonnage metals like commercial steels, aluminum, magnesium, copper, and their alloys. But it will have an important effect on industries dealing with such specialty materials as beryllium, titanium, molybdenum, tantalum, columbium (niobium), structural ceramics, and heat-resistant plastics.

(Piper) The space age will mean a lot to production plants specializing in really high-temperature materials. For example, we may be able to add cermets to structural materials making them more useful for space vehicles—say silicon nitride bonded with boron nitride, or zirconium carbide (which is "good" to 6332° F) bonded with zirconium boride ("good" to 5252°).

Q: What types of companies will be the biggest beneficiaries of such business?

A: (Ehricke) Special high temperature alloymakers, stainless steel producers, light metal companies.

Q: What can metalworking companies do to prepare for the space age?

A: (Hurich) Accelerate development of production and fabrication processes for highly reactive metals, such as titanium, beryllium, molybdenum, and columbium. The development of ductile ceramics and cermets would provide a new class of important materials for the space vehicle designer.

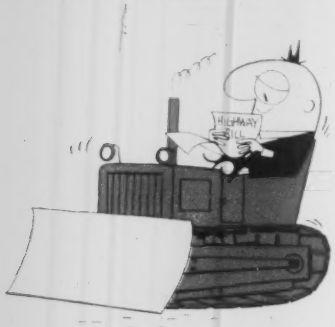
(Piper) Because spacecraft will be highly electronic (probably 50 to 75 per cent of total cost) and have complex pneumatic and hydraulic subsystems, fabrication of the vehicles may be the least rewarding. Metalworking must be content with manufacturing metal components that fall within their normal production experience, or they must develop an integrated vehicle and its supporting equipment.

AMA Calls for Ideas

A special "economic mobilization conference" will be called by the American Management Association on May 19-20 at New York. Purpose: To discuss steps management can take to beat the recession.

Some 16 heads of major corporations will explain what their companies are doing to foster economic growth and prosperity. Speakers include: Ralph J. Cordiner, president of General Electric Co.; Frederick R. Kappel, president of American Telephone & Telegraph Co.; Robert S. Ingersoll, president of Borg-Warner Corp.; and Thomas J. Watson Jr., president of International Business Machines Corp.

Ike-Nixon—The government will be represented on the program by Vice President Richard M. Nixon and Secretary of Commerce Sinclair Weeks. Climaxing the meeting will be a major policy address by President Dwight D. Eisenhower.



How Good Is the New Highway Bill?

TRADE ASSOCIATION executives and highway program officials, talking off the record, aren't too happy with the new highway bill. "It would have been a better one had it not been touted as an antirecession measure," says one spokesman. In long term thinking, these men don't believe the program will be as far ahead as it appears to be. The piecemeal legislative philosophy of Congress has put the program where forward planners can only see interstate system funds through fiscal 1960. That's no way to run a $30 billion to $40 billion program, affecting thousands of businesses and millions of workers, observers contend.

Congress has authorized $2.5 billion on the interstate system for fiscal 1961, "but it's just a paper figure," comments one official. To get the program on more solid footing, watch highway groups push the bill of Rep. Hale Boggs (D., La.) which would repeal the pay-as-you-go provision permanently. This year's Highway Act merely suspends that feature through fiscal 1960. Other highway legislation with a good chance for passage this year: Adoption of new cost estimates of the program as a basis for apportioning state funds, and Rep. George Fallon's (D., Md.) bill to codify federal highway laws.

How It Affects Metalworking

The American Road Builders' Association predicts the new bill will bring additional orders in 1958 for material and equipment to be delivered in 1959: 290,000 tons of fabricated steel, 200,000 tons of reinforcing steel, 15 million barrels of cement, $1.6 million of bituminous material, and $175 million worth of construction equipment.

Because the highway trust fund was short of money, several officials estimate the additional $800 million authorized by Congress for fiscal 1959-61 will increase contracts awarded in 1959 by only $200 million and those in 1961 by only $300 million.

An additional $400 million will go into primary and secondary highways in 1959, if the contracts are awarded by Dec. 1, 1958. That $400 million is subject to a special provision calling for a 2 to 1 participation by the federal government (in relation to state funds) rather than the traditional 50-50 procedure.

Nicaro Sale Plans Aired

Rep. Jack Brooks (D., Tex.) took another whack at Uncle Sam's nickel operation at Nicaro, Cuba, last week. Hearings by his Government Activities Subcommittee stressed the General Services Administration's efforts to sell the $85-million facility and Freeport Sulphur Co.'s contract to sell ore to Nicaro. (Government owned ore is being tapped, too.)

Originally scheduled to be disposed of by Mar. 31, Nicaro remains in federal hands, and will probably continue so through the year at least—unless GSA is willing to accept a bargain price.

The recession and Cuban politics have blocked its sale, observers think. Recent reports from Batista sources in Cuba have emphasized Castro inspired dynamitings at Nicaro, as well as "sabotage" at Freeport's Moa Bay Mining Co.

McKinsey Recommends ODM Shift

McKinsey & Co., a management consultant firm, has reportedly recommended the abolishment of the Office of Defense Mobilization. A new agency, combining ODM and the Federal Civil Defense Administration, would be created to handle the civil side of the nation's defense. McKinsey supplied one of the key members of the Gaither Committee, which recommended a radical increase in defense spending in the next decade and emphasized the necessity of an underground shelter program (something neither ODM nor FCDA has seen fit to endorse). The consulting firm was hired last year to go over the ODM setup in detail. While the report will probably not be made public, sources close to the White House and within ODM expect some sort of decisive shift to come soon.

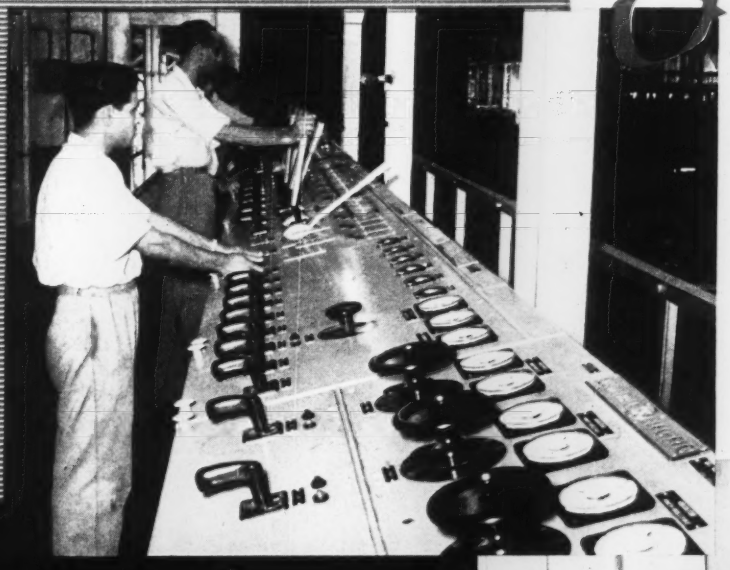
Look for Congress to use any ODM-FCDA shift as an excuse for investigation of ODM's restrictive powers on imports. If a new agency is set up, don't be surprised if it doesn't get such authority because of Congressional antagonism for agency-run programs in general this election year. Congress is looking for an excuse to advance its own tariff controlling gestures, especially with the Reciprocal Trade Agreements Act up for renewal.

Seaway Tolls Almost Set

E. Reece Harrill, assistant administrator, St. Lawrence Seaway Development Corp., reports seaway tolls will be announced soon. He hints there will be "a minor charge on the registered tonnage of a vessel, which would apply to all vessels, laden or in ballast, and a principal charge based upon the cargo."

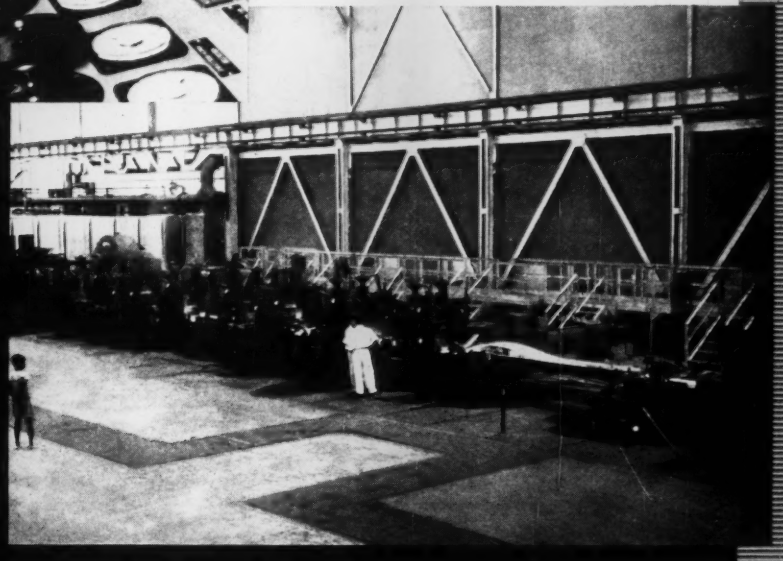
Mr. Harrill notes that over 80 per cent of seaway revenues will go for interest and principal on seaway indebtedness to the U. S. Treasury. Goal: Pay off the bill in 50 years. He expects seaway tonnage to quadruple within ten years. Between 12 and 13 million tons of cargo now move over the 14-ft channel annually.

MORGAN MILLS
at work in India



14" SKELP MILL

Tata Iron and Steel Co., Ltd.
JAMSHEDPUR, INDIA



Since 1917 Morgan Construction Company has been contributing skilled engineering talent and precision built continuous rolling mills to the national growth of India. The mill illustrated here is a 14" skelp mill recently installed for the Tata Iron and Steel Company at Jamshedpur.

This modern skelp mill is just one example of two-hundred and twenty-one Morgan Rolling Mills that have been designed, built and installed in plants all over the world.

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Shot Sales Are Strong

Use of shotblasting to clean structurals and plates by shipyards, steel plants, and fabricators brightens the sales outlook for equipment producers

THE rapidly expanding use of abrasive shot to clean plates and structurals is brightening the sales outlook for shotblasting equipment. Manufacturers believe 1958 equipment volume (estimated near $20 million) will compare favorably with 1957's.

Industry leaders predict 1958 shipments of shot and grit at about 140,000 tons. Metalworking uses more than 120,000 tons annually. Consumption of steel shot for cleaning prior to galvanizing or painting may be heavier than it was last year.

Says G. O. Pfaff, abrasive division manager, Wheelabrator Corp., Mishawaka, Ind.: "Wheelabrator expects an increase in abrasive volume this year. Blast equipment demand is good, but volume will be slightly lower than it was in 1957."

Growth Here — Foundries are switching to steel shot for mechanical cleaning to lower unit costs. Using steel shot to blast-clean structural shapes and plates is said to make the process competitive with other cleaning and descaling methods. Steel plants and fabricating shops now account for about 35 per cent of the installations of shotblasting equipment.

Shipyards are a growing market for shotblasting equipment: Bethlehem Steel Co. is installing a centrifugal wheel line at Baltimore for large (10 ft x 40 ft, 2 in. thick) plates. Both sides will be cleaned at 20 linear feet per minute. Pangborn Corp., Hagerstown, Md., built the equipment. It's also designed to descale and surface clean structural shapes. Shotblasting will eliminate acid pickling problems.

Methods Change—The air blast process is said to be losing some ground to the centrifugal wheel technique. Some big plants, like U. S. Steel Corp's American Bridge Div., Ambridge, Pa., already have centrifugal wheel installations. Several other large shops are considering such equipment for cleaning bridge structurals before painting.

While 21 companies make shot and grit, only about 12 supply steel shot. Two manufacturers, Wheelabrator Corp. and Pangborn Corp., design the bulk of centrifugal wheel equipment; about 20 sell air blast equipment.

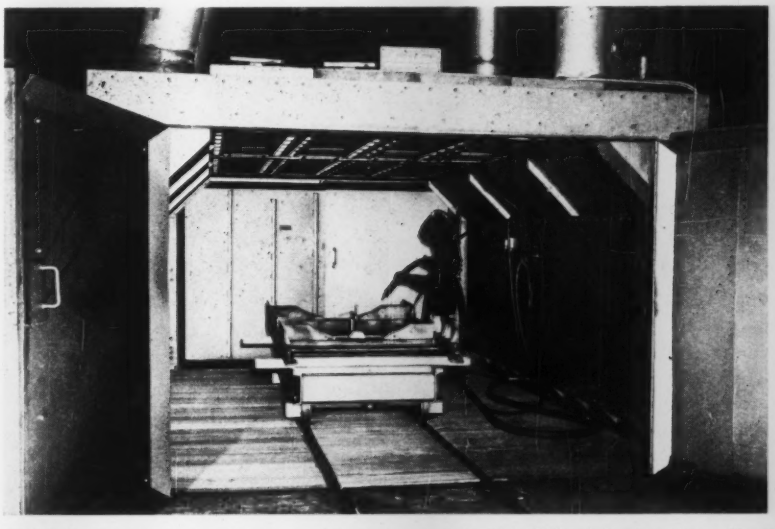
More Jobs—Gaining acceptance is shot cleaning of weldments, bearing plates, pipe skelp margins for electric welding, auto and truck frame members before cold forming, and wire. Most new gas cylinders are blast cleaned before painting, and many are reconditioned that way.

Blast cleaning of steel has gained wide popularity, largely because it offers: 1. Lower unit cleaning costs. 2. Good descaled surface. 3. Minimum downtime. Improvements in equipment design—alloy steel wheel parts and cabinet wear plates—have reduced maintenance costs and allow heavier abrasive flow. The development of quality control in steel shot production has also stimulated broader applications. Chilled iron grit, not normally used for cleaning, is used to etch mill rolls.

Despite mounting applications for shot, producers will have no difficulty meeting demand for some time. Capacity is well in excess of production. And it takes less abrasive to clean more area now, thanks to high carbon, high manganese, heat treated cast steel shot and grit. It offers a longer service life, and its controlled hardness makes for rapid cleaning.

Case Study—A Canadian producer of transmission towers operates a Wheelabrator machine in a conveyor line. Structurals pass through it before they're galvanized. A four-unit fixed wheel blaster cleans several small shapes simultaneously. Larger sections (like I-beams and partially fabricated work) are cleaned one at a time. One operator can clean 250 tons weekly.

The cleaning cost averages about 35 cents a ton. Rejects were cut from 10 to 2 per cent without an acid pickle. All rejects can be eliminated by following up with a 3-minute acid rinse. The combination of mechanical cleaning, acid rinse, and galvanizing has nearly halved the labor force required when the plant used a straight pickling process.



Welded structural members are blast cleaned in this Wheelabrator "room" at Edwards Iron Works, South Bend, Ind.

Push for Markets

Producers say research and sales promotion will stimulate uses of lead and zinc

LEAD AND ZINC officials took a long, hard look at their industries at the annual conventions of the American Zinc Institute Inc. and Lead Industries Association in St. Louis. Consensus: Both have been lax in promoting, selling, and expanding markets through research, but it's not too late for the industries to change.

Studies—A long range research program designed to expand markets and create new ones will be formally launched by the two groups around midsummer with the hiring of a research director.

Two Significant Aspects—1. No limit has been set on expenditures. 2. The program will be sponsored by foreign and domestic companies.

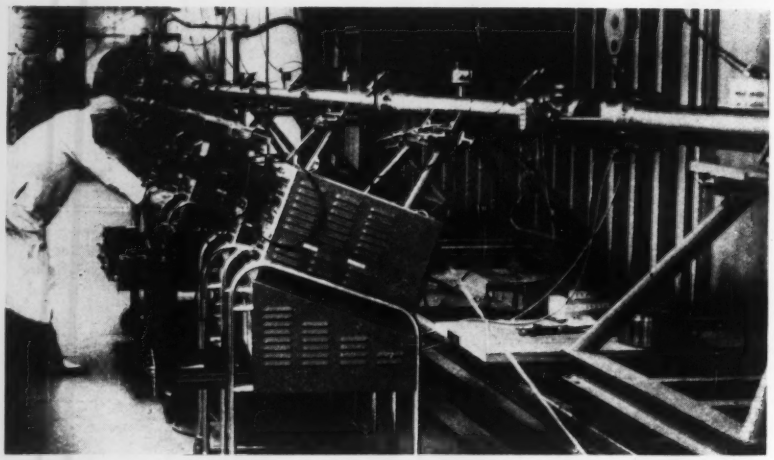
"Perhaps we are in our present plight because the industry in the past has been stingy with promotion funds," declared Simon D. Strauss, vice president of sales for American Smelting & Refining Co. Mr. Strauss said the portion of revenue allotted to sales expenses is smaller than that of any other industry.

"Technical information should be made more readily available to the designer," Mr. Strauss said. AZI will employ a man to work with automotive designers and engineers in Detroit.

Prospects—Business this year has both its bright and dark spots, delegates were told. Shipments of galvanized sheet should hit around 2,420,000 tons, slightly better than the 1957 figure, says Ralph C. Miller Jr. of Jones & Laughlin Steel Corp. Other zinc markets such as diecastings and brass uses aren't expected to do so well.

In lead, storage batteries are expected to be off around 5 per cent. Tetraethyl lead sales are seen at the 1956 and 1957 levels. Consumption of lead in cable sheathing is on the decline, as are applications in construction.

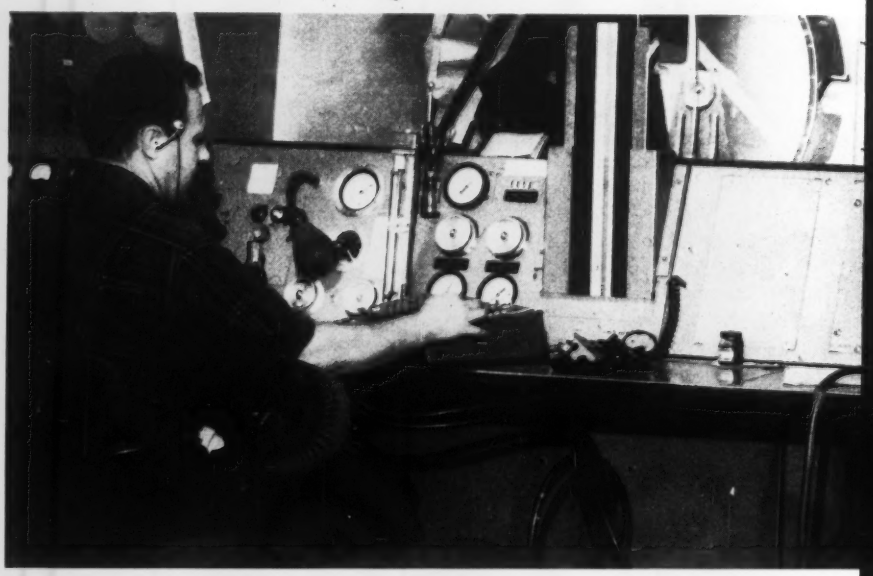
Over-all consumption of both metals will be down this year, but producers look for a rise in most markets in 1959.

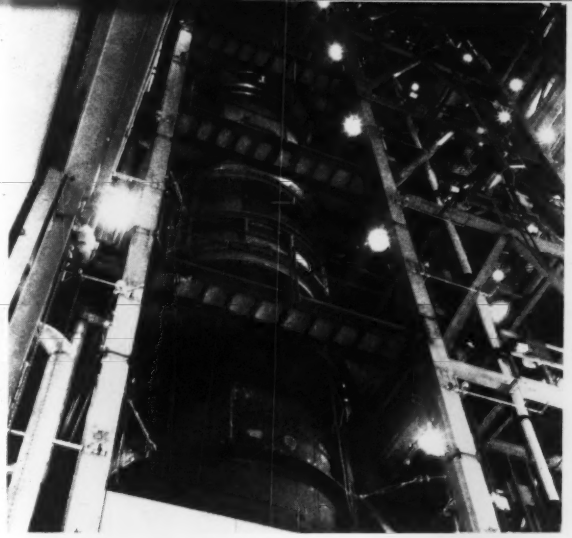


(1) Miniature nose cones are subjected to extremes of heat and pressure in shock tube studies at Avco Mfg. Corp., Lawrence, Mass. Drop tests, using full scale re-entry vehicles, are also being conducted. The two methods of testing have solved the warhead re-entry problem, the Air Force's Ballistic Missile Division says

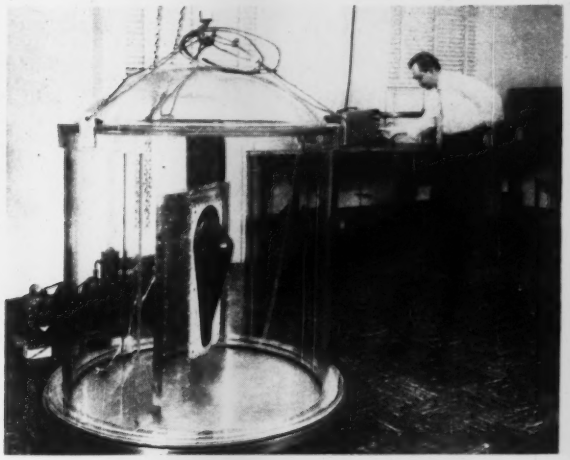
Testing the Titan . . .

(4) Scale models of the Titan are subjected to transonic and supersonic wind speeds and various atmospheric pressures at California Institute of Technology's Jet Propulsion Laboratory, Pasadena, Calif. Martin Co. supervises the wind tunnel tests





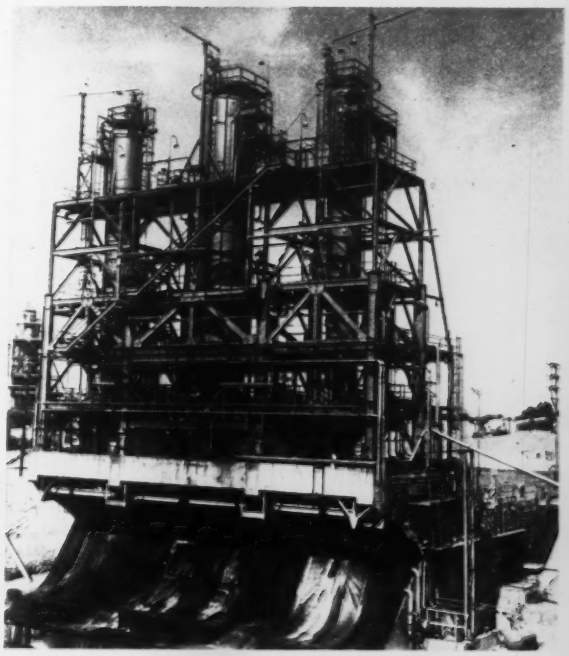
(2) At Martin Co.'s Denver plant, where airframe components are integrated, a cold flow laboratory tests propellent flow rates and tank pressurization. Components, subsystems, and systems are tested in these heavy-walled tanks, equal in size to the Titan itself



(3) Airborne antennas are tested in bell jars at H. A. Wheeler Laboratories Inc., Great Neck, N. Y., a subcontractor to Bell Telephone Laboratories. Properties of radio frequency output from the antennas are studied while atmospheric pressure inside the jar is varied

• • **THE MISSILE** which may be used to launch a satellite weighing up to 3 tons, the Titan ICBM, is approaching final development testing. Titans have been built (the exact number is classified) and have been captive tested. The bird may be operational by 1960.

Here are some examples of testing techniques.



(5) Aerojet-General Corp.'s Sacramento, Calif., facility includes a cold flow laboratory, environmental testing fixtures, and a battery of rocket engine test stands. Complete engines and components are tested. Full duration testing permits study of starting procedures, full duration firing, and programmed shutdown. Gimballing during full thrust firing checks out performance of the engine's altitude control mechanism

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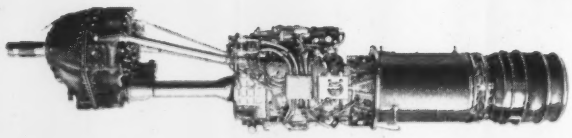

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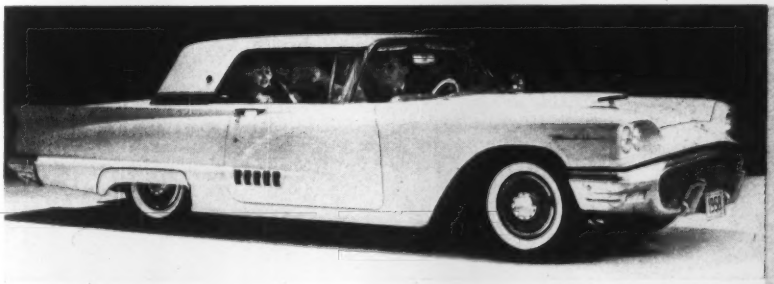
1908–1958 GM FORWARD FROM FIFTY

HYATT HY-ROLL BEARINGS FOR MODERN INDUSTRY

What Do Car Buyers Want?



Styling surveys show . . .

Ford's T-Bird Liked Most

GM's Buick Liked Least

Motivational research might help prevent costly errors in car styling by revealing what consumers really want instead of what they say they want

MOTORDOM believes that, other things being equal, styling is the biggest factor in sales appeal. The perpetual problem of designers is trying to guess what the car buying public will want in cars that won't appear for at least two years. Just when Detroit thinks it has the right combination, attitudes change.

A good example this year is the Oldsmobile - Buick story. In most series the two are basically similar in price, size, and mechanical features. Both had less than successful styling in '57 and both made comparable styling changes for '58.

But Buick sales are estimated to be down more than 35 per cent in the first quarter, while Oldsmobile has inched into fourth place behind Ford, Chevrolet, and Plymouth.

Why?—Many factors affect sales. Buick blames its advertising for the poor showing. Oldsmobile credits its success to high resale value, good quality, a strong dealer organization, and a large group of loyal Olds buyers.

J. F. Wolfram, Oldsmobile general manager and General Motors vice president, adds: "We believe Oldsmobile earned this position in the market by continuing to design and build a car specifically for the medium price market." This may be true, but other cars (including Buick) can make the same claim. And their sales aren't holding up. As far as motordom can determine, the difference between Oldsmobile and Buick is styling.

Let's Find Out — Since styling seems to count, Louis Cheskin, director, Color Research Institute, Chicago, suggests motivational research might help automakers discover what people want in time to change designs or at least to plan marketing campaigns playing up each car's strong points.

Motivational research supposedly finds out what people subconsciously want instead of what they say they want. Mr. Cheskin calls it "unconscious testing." He says: "Last year our tests showed people reacted favorably to elaborate ornamentation, gaudy color combinations, and intricate chrome trim.

"But our studies show people who were attracted by frills a year ago now react unfavorably to functionless objects. Flamboyant fins and chrome trim don't excite the 1958 shopper and will appeal even less to the 1959 and 1960 buyers."

Studies Reveal—Using such testing methods, Mr. Cheskin finds Ford's Thunderbird ranks first in styling appeal and Lincoln second. Chevrolet and Oldsmobile are fairly high; Buick and Pontiac are on the

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bottom part of the list stylewise.

T-Bird and Lincoln styling features less chrome and more utilitarianism. Pontiac and Buick approach elaborate ornamentation Mr. Cheskin claims buyers no longer want. Sales and production figures seem to substantiate his theory: Ford says it has built 10,000 four-passenger Thunderbirds and that dealers have more than 10,000 unfilled orders.

Not Napping — Automakers are not unaware of Mr. Cheskin's conclusions. Says Harley J. Earl, GM's styling vice president: "In past surveys estimates were that 15 per cent of the people wanted less chrome and 85 per cent want chrome as we had it. This percentage has dropped to 50-50, and we're deleting chrome as rapidly as possible."

No Help—No matter how much motivational research reveals about people's real wants, it still won't help design cars that won't appear for two more years. At best it may decrease the magnitude of errors.

Mr. Cheskin suggests motivational tests on parts such as grilles, light assemblies, and quarter panels could be conducted in advance without tipping off new model plans. Edsel's story might have been different if such tests had been run before finalizing designs.

Reports Mr. Cheskin: "In an association test we made as soon as the Edsel appeared, respondents were asked to associate the car image with one of five years—1935, 1940, 1945, 1950, 1955. The greatest number associated it with 1935." This isn't quite the youthful, futuristic appeal Edsel aimed for.

Look Ahead—Over a period, Mr. Cheskin believes, producers can build up a backlog of test surveys which point out trends with some accuracy. "Our studies show that in the next few years we should expect customer resistance to frills. We have some evidence it may be advisable for carmakers to change styling every three years, co-ordinating style changes with product improvement. Cars with the greatest simplicity of design will be in greatest demand."

Ford Realigns Company

Ford Motor Co. has rearranged six manufacturing divisions and placed them into two new groups—a Power Train group and a Body group. Henry Ford II, president, explains this arranges plants so they are more closely related in respect to processing techniques, engineering requirements, and products.

The Power Train group includes the engine and foundries division and the transmission and chassis division. C. H. Patterson, newly elected Ford vice president, will head it.

Irving A. Duffy is in charge of the Body group which includes metal stamping, hardware and accessories, steel and glass divisions. K. D. Cassidy, former group executive, general products, will act as director and assist Mr. Duffy.

D. S. Harder, executive vice president, has reached retirement age. Although he resigned from his post, he'll still act as a vice president and technical adviser to Messrs. Ford and Breech.

Ray H. Sullivan, vice president in charge of the former engine and foundry and metal stamping groups, will retire in September. He has asked to be relieved of direct line responsibility and will collaborate with Mr. Harder.

In other changes, Mr. Ford announces a manufacturing research office has been established under the direction of D. J. Davis, vice president. It will be responsible for advanced production engineering projects, manufacturing research and development.

Ford's central purchasing office will continue under the direction of Earl G. Ward, vice president who reports to Messrs. Ford and Breech.

U. S. Auto Output

	Passenger Only 1958	1957
January	489,357	641,591
February	392,112	571,098
March	357,049	578,826
3 Mo. Total	1,238,518	1,791,515
April		549,239
May		531,365
June		500,271
July		495,629
August		524,354
September		284,265
October		327,362
November		578,601
December		534,714
Total		6,117,315

Week Ended	1958	1957
Mar. 22	80,560	138,646
Mar. 29	93,844	130,233
Apr. 5	64,318	130,318
Apr. 12	84,997	126,194
Apr. 19	74,483†	118,327
Apr. 26	68,000*	123,633

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

On the Labor Front

There's a fair chance the auto companies can get another three-year contract, but they'll have to grant wage increases and more SUBenefits to do it. Some "experts" are betting increases in final settlements will be 10 to 12 cents.

GENERAL MOTORS is being pressured for a direct wage increase, so productivity is the big battle area. Preliminary positions find the UAW sticking to its 3.9 per cent figure while GM barricades itself behind a 2.5 per cent maximum rate. Obvious meeting ground: Just under 3 per cent, using GM's theory of productivity.

Indicating automakers will give wage increases is Edward N. Ragsdale's (Buick general manager and GM vice president) assertion that car prices will go up next year if "labor succeeds in winning a bigger wage increase than that provided by its present contract."

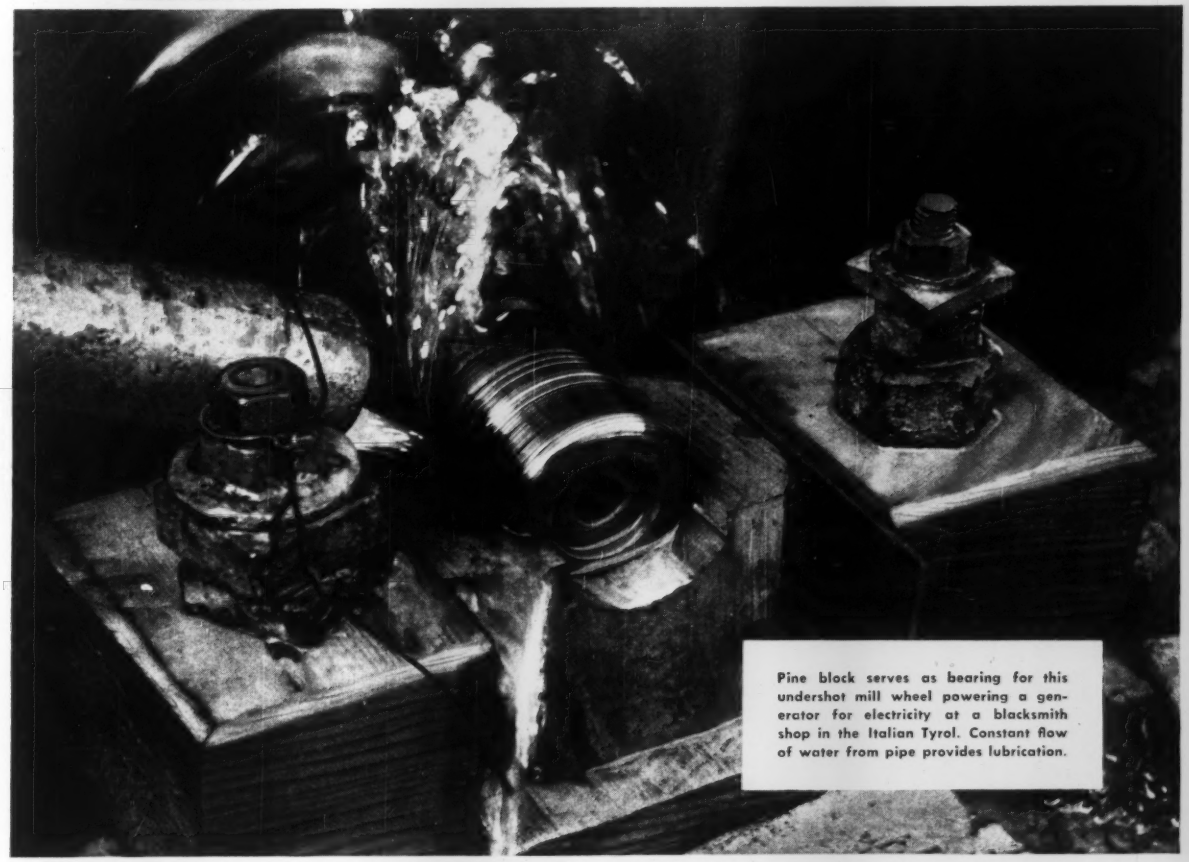
FORD MOTOR CO. is reportedly having tough going in the fringe benefit area. Ken Bannon who heads up the union team at Ford wants better coverage on plant transfers and relocation. Another objective: Broader seniority provisions.

CHRYSLER CORP., as expected, is being deluged with work standard arguments, but company sources say they'll be tough because Chrysler can't afford to give in here if it wants to remain competitive.

The UAW is making plant relocation demands at Chrysler, too. Its aim apparently is to win concessions from Ford along these lines which it may be able to use on Chrysler negotiators.

SKILLED TRADES have won their first round for recognition. The National Labor Relations Board has ruled against the UAW in favor of five craft unions seeking representation elections for some 5000 workers in Big Three plants. Although the UAW has appealed, it seems likely that most of the other 79 petitions on file with the NLRB will also get a favorable ruling.

ND FACTS



Pine block serves as bearing for this undershot mill wheel powering a generator for electricity at a blacksmith shop in the Italian Tyrol. Constant flow of water from pipe provides lubrication.

Is pillow block inefficiency costing your plant money?

The need for relubrication of pillow blocks is *more* than costly today! It's *passé*. For New Departure's new pillow block line is built around the performance-proved Type AE adapter ball bearing with *Sentri-Seals*. Dirt, moisture and wear are sealed *out* . . . grease is sealed *in — for life!* Send for details about New Departure pillow blocks. Ask today for Catalog PBC-A.

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1908–1958
GM
FORWARD FROM FIFTY

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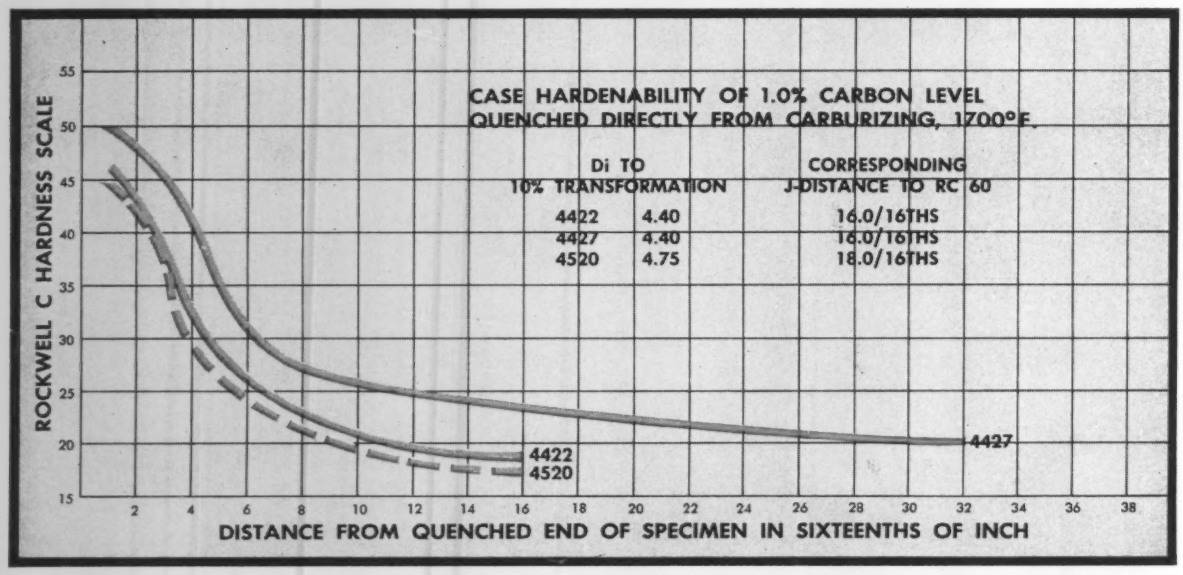

The Timken Company is now producing in quantity three new molybdenum carburizing steels—4422, 4427 and 4520. These new steels are already providing important economies for manufacturers of ring gears, pinions, transmission and differential gears.

These fine grained direct quenching steels offer the following advantages:

1. ECONOMY—They offer you overall economies in every step of your production process.

2. EASILY ANNEALED—These steels respond to simple annealing treatments including direct air cooling.

3. MACHINABILITY—Users of these steels report good machinability.

4. HIGH CASE HARDENABILITY—See chart.

5. HIGH CASE HARDNESS—Direct quenching from 1700°F produces high case hardness.

6. A DESIRABLE RANGE OF CORE HARDENABILITY—See chart.

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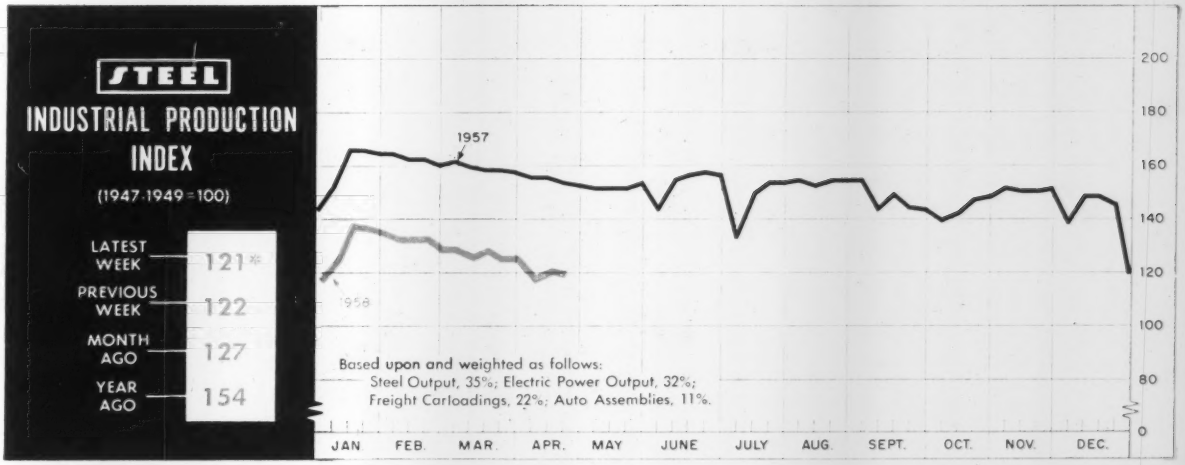

*Week ended Apr. 19.

Slow Auto Sales Dampen Hopes for Pickup

LACK OF INTEREST in new car buying this month sounds the death knell for a business upsurge before summer. But it may hasten the eventual recovery—which many economists schedule for the fourth quarter—by speeding up the introduction of new models.

Automakers have been watching ten-day sales reports, hoping for a glimpse of the "traditional" spring splurge. Since 1949, March has marked the beginning of the upturn, with the exception of 1952, when it began in April. Now April is almost over, and buyers still aren't breaking down dealers' doors. Sales during Apr. 1-10 came to only 13,330 units a day, compared with daily averages of 14,615 in January, 13,400 in February, and 14,000 in March.

Result—Producers evidently are convinced that the rest of April will be no better than the first one-third because they are making further cuts in the production schedules to keep dealers' stocks from resuming their climb. During the week ended Apr. 19, the industry scheduled only 74,483 units, says *Ward's Automotive Reports*. That's a decline of 37 per cent from the corresponding year-ago figure.

(About this time last year, automakers began cutting production to bring inventories under control.) Production last week was expected to decline even more, possibly to the low point of the year.

The situation has led to speculation that motordom's top brass is pondering the early introduction of 1959 models—maybe as soon as mid-September. Some Detroit informants are sure that at least two of the Big Three will phase out the '58s in late June or early July and take the next two months to make model changeovers. Tooling will be no problem because only moderate changes are in the cards for the '59s.

Reaction—If such a schedule pans out, it may give the economy a boost before the fourth quarter. Steel

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,265[1]	1,285	2,269
Electric Power Distributed (million kw-hr)	11,300[1]	11,307	11,485
Bituminous Coal Output (1000 tons)	6,950[1]	6,170	9,950
Crude Oil Production (daily avg—1000 bbl)	6,200[1]	6,187	7,551
Construction Volume (*ENR*—millions)	$304.5	$354.6	$394.5
Auto, Truck Output, U. S., Canada (*Ward's*)	99,984[1]	110,663	151,357
TRADE			
Freight Carloadings (1000 cars)	525[1]	521	687
Business Failures (Dun & Bradstreet)	342	352	308
Currency in Circulation (millions)[3]	$30,733	$30,744	$30,681
Dept. Store Sales (changes from year ago)[3]	−16%	+11%	+7%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$24,151	$19,320	$21,956
Federal Gross Debt (billions)	$272.2	$272.3	$274.6
Bond Volume, NYSE (millions)	$30.4	$25.3	$15.6
Stocks Sales, NYSE (thousands of shares)	12,224	10,376	8,672
Loans and Investments (billions)[4]	$89.8	$89.5	$86.9
U. S. Govt. Obligations Held (billions)[4]	$28.1	$28.1	$26.3
PRICES			
STEEL's Finished Steel Price Index[5]	239.15	239.15	227.41
STEEL's Nonferrous Metal Price Index[6]	196.2	195.9	207.4
All Commodities[7]	119.4	119.6	117.2
Commodities Other than Farm & Foods[7]	125.9	125.8	125.3

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1958, 2,699,173; 1957, 2,559,490. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

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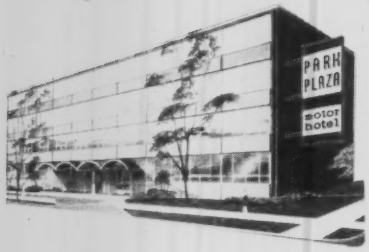

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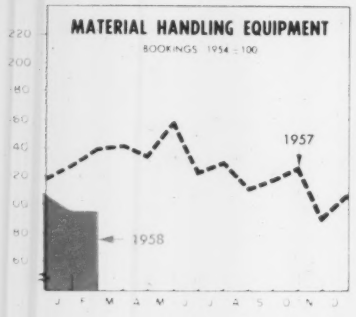
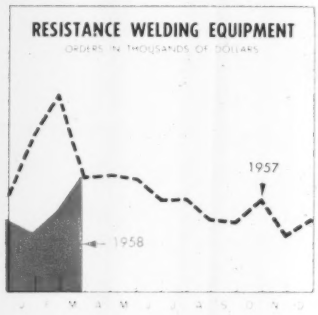
THE BUSINESS TREND





	1958	1957	1956	1955
Jan.	93.07	126.34	122.43	97.00
Feb.	93.49	139.29	129.56	98.71
Mar.	.....	140.76	166.14	149.16
Apr.	.....	132.67	145.20	109.52
May	.....	157.95	155.53	110.50
June	.....	121.57	189.13	139.00
July	.....	128.31	165.50	111.76
Aug.	.....	110.09	168.70	106.20
Sept.	.....	116.79	130.35	136.80
Oct.	.....	124.80	143.38	123.52
Nov.	.....	87.80	138.50	118.09
Dec.	.....	105.65	117.76	139.85
Avg	....	124.34	147.68	120.01

Material Handling Institute Inc.

Charts copyright, 1958, STEEL.

	Net Orders 1958	Net Orders 1957	Shipments 1958	Shipments 1957
Jan.	1,243	3,310	1,422	3,161
Feb.	1,683	4,161	1,615	2,386
Mar.	2,384*	2,360	1,602*	2,845
Apr.	.....	2,429	....	3,111
May	.....	2,340	....	2,891
June	.....	1,936	....	2,735
July	.....	1,943	....	3,194
Aug.	.....	1,501	....	2,591
Sept.	.....	1,463	....	2,528
Oct.	.....	1,933	....	1,953
Nov.	.....	1,167	....	2,227
Dec.	.....	1,501	....	1,969
Totals	.....	26,044	....	31,591

*Preliminary.
Resistance Welder Manufacturers Assn.

for such a program would have to be ordered in July for delivery in August. Model buildup would probably be slow and orderly, with enough inventory in dealers' hands to open the showrooms by Sept. 15. That's the date one of the Big Three is reportedly shooting for. (Last year's introductions came mostly between Oct. 15 and Nov. 15.)

Steelmakers Eye Upturn

That the steel industry—and the economy in general—needs some stimulus becomes more evident each week. Steelmakers report the national operating rate for the week ended Apr. 27 at 47 per cent of capacity, down another half point from the previous week. But a stimulus is expected momentarily because of two factors: 1. Steel inventories are expected to reach the minimum point by July 1 (see Page 135). 2. If consumers are going to beat the anticipated price hike around July 1, they will have to place orders within the next three or four weeks.

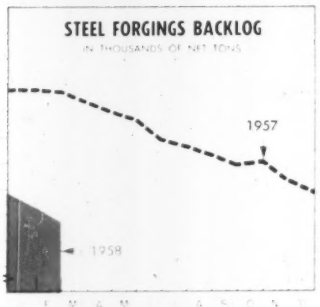
Along with the gradual, but persistent, downturn in both auto and steelmaking, STEEL's industrial production index is plagued with weak freight carloadings and slippage in electric power output. There is no hope for an upturn in the rail freight business until Great Lakes ore shippers open their season, which won't be until May 1. And output of electricity may continue to decline for another two weeks, then level off until the heat of early summer brings air conditioners into play.

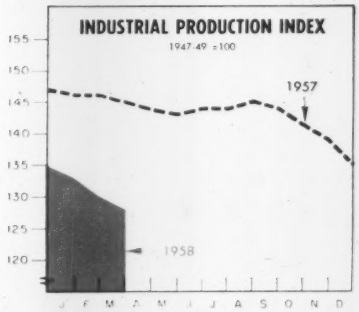
It looks as if STEEL's index is destined to bounce around the 120 level (1947-49=100) until one or more of the elements begins to come up to expectations.

Incorporations Strong

Regardless of the bleak short term outlook, many persons still find this a desirable time to go into business. Last month, says Dun & Bradstreet Inc., 11,670 new businesses were chartered, a decline of only 3.2 per cent from the March, 1957, figure. The February figure was 10,466. For the first quarter of this year, incorporations totaled 35,216, a decline of 2.8 per cent from the year-ago period. At the present rate, 1958 will end up the fourth best year on record for new businesses.

At the same time, D&B reports that business failures in March set a new postwar record of 1495. This





	Shipments 1958	Shipments 1957	Unfilled Orders 1958	Unfilled Orders 1957
Jan.	108	148	318	537
Feb.	93	135	288	533
Mar.	...	146	...	517
Apr.	...	139	...	497
May	...	135	...	479
June	...	128	...	445
July	...	104	...	431
Aug.	...	115	...	417
Sept.	...	117	...	397
Oct.	...	126	...	401
Nov.	...	105	...	365
Dec.	...	99	...	343

U. S. Bureau of the Census. Data based on reports from commercial and captive forge shops with monthly shipments of 50 tons or more.

(Seasonally Adjusted)

	Total Production 1958	Total Production 1957	Primary Metals 1958	Primary Metals 1957	Metal Fabricating 1958	Metal Fabricating 1957
Jan.	133	146	100	143	159	180
Feb.	130	146	95	143	153	180
Mar.	128	145	92	137	150	179
Apr.	...	144	...	136	...	176
May	...	143	...	132	...	175
June	...	144	...	132	...	177
July	...	144	...	133	...	177
Aug.	...	145	...	136	...	177
Sept.	...	144	...	131	...	174
Oct.	...	141	...	128	...	168
Nov.	...	139	...	121	...	170
Dec.	...	135	...	107	...	163
Avg	...	143	...	132	...	175

figure has been topped only once since 1933—in January, 1939. However rate per 10,000 listed businesses was 60 in March, well below the 1939 rate of 70.

Optimism Grows

Producers of capital equipment are still feeling their way along the bottom, but they are becoming a little more optimistic about their chances for a good year. Even though the change in dollar volume of new orders in the material handling equipment industry was almost unnoticeable in February, (see chart and table, Page 74) the president of the institute, R. L. Fairbank, declares: "The chance for a spring upturn in the industry now appears brighter than it has in the last two months."

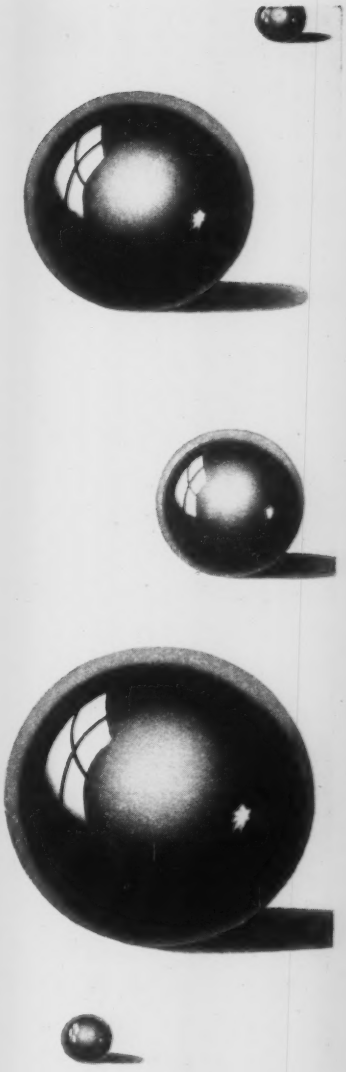
Several spokesmen point out that the slight upturn is an indication that the falling business conditions in their industry have leveled off. Dollar volume for the remainder of the first quarter is expected to be about the same as in 1957's fourth period, with steady increases during the next two quarters.

Makers of resistance welding equipment also see a steady pickup in orders (see chart, Page 74). March was the best month since April, 1957.

Machine tool builders now have a three-month uptrend going, which is boosting morale in the industry. Net new orders for both cutting and forming type machine tools last month came to $33,350,000, an increase of $7,050,000 over February's figures. Cutting type tools accounted for $29,150,000 of the total, an increase of 28 per cent over the previous month. Shipments of both types of tools totaled $53.6 million, up about $5.5 million from February.

National Machine Tool Builders' Association points out that the March increase was due principally to a few sizable orders placed in special areas, and it was not felt throughout the industry. It is possible this lumping of orders might show up as an abnormal gain, followed by a falling-off in subsequent months.

But producers of foundry equipment are still waiting for things to start popping. Orders for new equipment in February declined fractionally to 57.6 per cent of the 1947-49 base period. It is the lowest figure since the industry started reporting orders in 1953.



COOLIDGE
Balls

CHROME ALLOY
AND
STAINLESS

COOLIDGE CORPORATION
MIDDLETOWN, OHIO

Ohio Rolls

FIRST AGAIN!

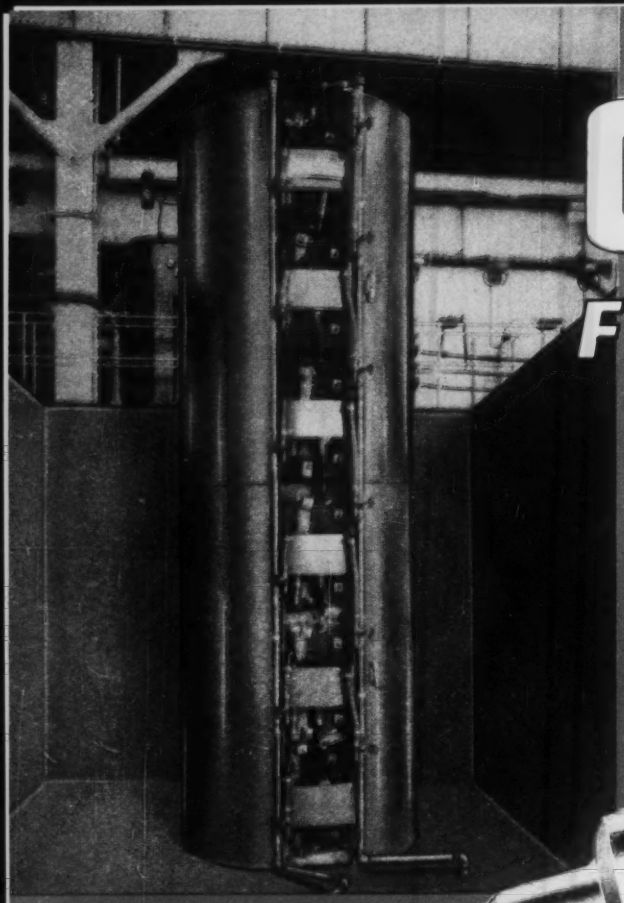
in

REHARDENING

and

REMAKING

too



One of Ohio Steel's induction heating units used in removing original hardening and stresses from rolls to be rehardened.

- Induction heating process (used exclusively by Ohio Steel) removes original surface hardening and stresses
- Prevents distortion of journals
- Eliminates rebuilding and re-machining journals
- Roll is rehardened by progressive induction hardening and returned to mill with no change in the close tolerance dimensions of the journals.

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THE OHIO STEEL FOUNDRY CO.

LIMA, OHIO

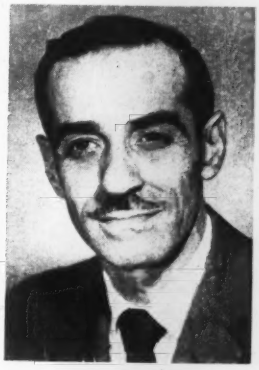
Plants at Lima and Springfield, Ohio

LIMA... *Virtually at the center of the steel industry*

OR23

Ohio Iron and Steel Rolls: Carbon Steel Rolls—Ohioloy Rolls—Ohioloy "K" Rolls—Flintuff Rolls—Double-Pour Rolls—Chilled Iron Rolls—Denso Iron Rolls—Nickel Grain Rolls—Nioloy Rolls—Special Iron Rolls—Forged Steel Rolls

FRANCIS W. HOLBROOK
Kropp Forge sales-marketing



FRANK J. PALERMO
Case dir.-manufacturing

WILFRED D. MacDONNELL
Great Lakes Steel president

H. G. BAUER
De Laval exec. v. p.

Francis W. Holbrook fills the new post of manager of sales and marketing, **Kropp Forge Co.**, Chicago. He was formerly marketing manager for AmForge Div., American Brake Shoe Co.

Frank J. Palermo fills the new post of director of manufacturing at **J. I. Case Co.**, Racine, Wis. He was manager of the Bettendorf, Iowa, plant.

John G. Frischkorn Jr. was appointed sales manager, **Cleveland Tramrail Div.**, Cleveland Crane & Engineering Co., Wickliffe, Ohio. He succeeds **A. F. Anjeskey**, retired.

Robert D. Crane was made assistant director of purchases for **Dresser Industries Inc.**, Dallas. He was purchasing manager for Dresser Mfg. Div., Bradford, Pa.

Glenn P. Kraft was named superintendent, stainless steel department, at **Armco Steel Corp.'s** Middletown, Ohio, Works. He succeeds **George E. Fahrenholz**, retired.

E. E. Stvan was made general merchandising manager, **Strong, Carlisle & Hammond Div.**, White Sewing Machine Corp., Cleveland.

James A. Ward was named general manager of the Utica, N. Y., plant of **Sperry-Rand Corp.** He was chief engineer. He succeeds **Aubrey W. Detwiler**, on leave of absence due to ill health.

C. Wesley Murray was made manager of knife sales for **Heppenstall Co.**, Pittsburgh.

Wilfred D. MacDonnell was elected president, **Great Lakes Steel Corp.**, Ecorse, Mich., subsidiary of National Steel Corp. Former vice president-operations, he succeeds **Paul Carnahan**, now chairman. **Charles G. Tournay**, vice president of Great Lakes Steel, was appointed assistant to the president of **National Steel Corp.**

Geoffrey Grange was appointed sales manager for **C. A. Norgren Co.**, Englewood, Colo., to succeed **Frank T. Goll**, who resigned in January to become Norgren district sales representative in Buffalo. For the last seven years, Mr. Grange was managing director of C. A. Norgren Ltd., England.

Vernon M. Roosevelt was named manager of **Reynolds Metals Co.'s** foil carton and printing plant at Richmond, Va.

John W. Carlson was made superintendent of the blast furnace department, Pueblo, Colo., plant, **Colorado Fuel & Iron Corp.** He succeeds the late **John W. Monson.**

Joseph P. D'Arezzo was named director of planning for **American Machine & Foundry Co.**, New York.

Eclipse Machine Div., Bendix Aviation Corp., named **Robert K. Gornall** sales manager of carburetors at Detroit; **John A. Riopelle**, sales manager of fuel nozzles in Elmira, N. Y.

George S. Arneson was made director of marketing for **Borg-Warner Industrial Cranes**, Ingersoll Products Div., Borg-Warner Corp., Chicago.

H. G. Bauer was elected executive vice president, **De Laval Steam Turbine Co.**, Trenton, N. J. He was vice president-general sales manager, and continues in the latter post. **Harry Engvall** was elected vice president-engineering.

Elmer F. Franz and **John A. Baldinger** were elected vice presidents of **Yale & Towne Mfg. Co.**, New York. Mr. Franz continues as treasurer. Mr. Baldinger continues in Philadelphia as general manager of the Yale Materials Handling Div.

Robert W. Ebey was appointed manager of ball sales, **Hoover Ball & Bearing Co.**, Ann Arbor, Mich. Formerly ball sales were under the supervision of **John B. Fyfe**, assistant sales manager, who retires in January, 1959. Until then he will serve in a staff capacity, continuing active in the ball sales program.

John D. Simms, assistant vice president, who has directed factory operations at **Merkle-Korff Gear Co.**, Chicago, assumes administrative duties relating to sales. **Robert J. Marlatte** succeeds Mr. Simms as plant manager. Mr. Marlatte was vice president - manufacturing at Production Instrument Co.

L. E. Dearborn was made general sales manager, tractor and implement division, **Ford Motor Co.**, Birmingham, Mich. He succeeds **E. H. Wood**, who takes over a Ford tractor and implement distributorship.

Peter C. Rossin was made technical director of the new Refractomet

EDGAR L. McFERREN GEORGE K. CASSADY WALTER B. WIGTON

Giddings & Lewis administrative changes

Div. at **Universal-Cyclops Steel Corp.**, Bridgeville, Pa.

Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., named **Edgar L. McFerren** vice president-sales and **George K. Cassady**, general manager of field sales. Mr. McFerren was general manager, G&L and Hypro Div. **Harry C. Soukup** continues as works manager of that division and becomes acting general manager. Mr. Cassady was general manager, Davis Boring Tool Div., and is succeeded by **Walter B. Wigton. William M. Ritter** was made sales manager of the Davis division. **Walter L. McCann** succeeds Mr. Wigton as chief engineer, G&L and Hypro Div.

Union Tank Car Co., Chicago, elected **J. W. Van Gorkom** and **D. C. Graves** vice presidents. Mr. Van Gorkom continues as treasurer. Mr. Graves previously was assistant vice president in charge of the mechanical department. **B. C. Graves**, chairman, was appointed honorary chairman following his request to be relieved of duties as active board chairman.

Walter Schmidt was elected vice president-sales engineering for **Milwaukee Crane Div.**, Industrial Enterprises Inc., Milwaukee. He is succeeded by **Donald Reiff** as chief engineer for the division.

Clifford A. Mikus was made plant engineer at the Coraopolis, Pa., plant of **Russell, Burdsall & Ward Bolt & Nut Co.**

William Peters was named manager of the New York branch office for **American Air Filter Co. Inc.** He was assistant general sales manager, Anemostat Corp. of America.

E. G. Klein was elected president, **Feller Engineering Co.**, Pittsburgh. He succeeds **Karl Feller**, retired.

Charles Anthony joined **Mertes-Millar Inc.**, Milwaukee, as vice president-manufacturing.

Gerald L. Owens was made assistant general plant superintendent, **Great Lakes Steel Corp.**, Ecorse, Mich., subsidiary of National Steel Corp. He is succeeded as manager of primary production by **James G. Smith.**

Louis F. Jagucki was appointed chief plant engineer; **Earl G. Gray**, plant engineer of **Wheeling Steel Corp.'s** Benwood Works plant, Benwood, W. Va.

Hoskins Mfg. Co., Detroit, appointed **John E. Puvogel** vice president-manufacturing; **Robert I. Cratch**, vice president-marketing; **John M. Thomas**, vice president in charge of new product planning and development.

H. F. Froehlich was made group manager, **Sherman Products Inc.**, Royal Oak, Mich., responsible for manufacturing, engineering, and purchasing-production control departments.

Arvid S. Fredrickson succeeds **C. G. Margwarth**, retiring July 1, as chairman of **Lakeside Bridge & Steel Co.**, Milwaukee. Mr. Fredrickson continues as executive vice president. He had been vice chairman.

C. R. Toolin was made district sales engineer for the Cleveland-Pittsburgh area for **Fenn Mfg. Co.**

M. L. Mitzel was named manager of **Aluminum Co. of America's** Detroit Works, succeeding **I. S. Dow**, now Cleveland Works manager.

Harry X. Willkie was made mid-Atlantic regional manager, **Davey Compressor Co.** He is at Ridgewood, N. J.

William D. Lease was elected executive vice president, **Athey Products Corp.**, Chicago. He was vice president-sales.

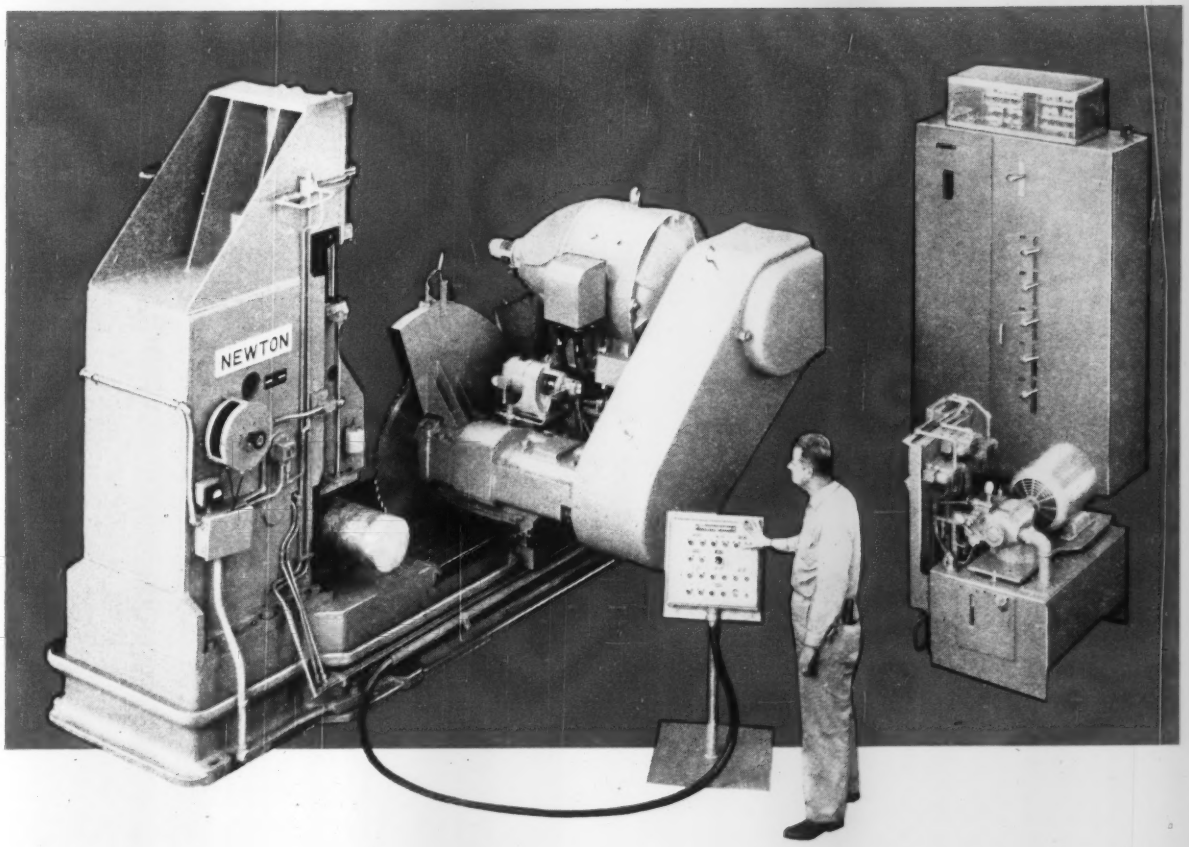
Stoner-Mudge Co., a division of American-Marietta Co., Pittsburgh, appointed **George W. Seagren** director of research.

J. I. Ashley was named sales manager, General Tool Div., **General Fire Extinguisher Corp.**, Culver City, Calif.

Donald A. Anderson was made district sales manager, **Duff-Norton Co.**, Pittsburgh. He heads sales for

JOHN E. PUVOGEL ROBERT I. CRATCH JOHN M. THOMAS

Hoskins Mfg. vice presidents



cuts off 9″ aluminum billets at 250″ per minute!

Equipped with a 60″-diameter saw blade, this Newton® cold saw has the capacity for handling aluminum billets up to 22″ diameter, in one pass. It will cut off 9″ billets at a feed rate of 250″ per minute.

Arranged for adjustable-speed, direct-current motor drive, the machine features special hydraulic-cylinder feed to saw carriage, giving infinite changes. Cycle is push-button controlled from a movable panel through the use of solenoid-operated valves. Spindle-speed range is 80 to 320 RPM.

The Newton cold saw can be furnished with an automatic billet-feeding and gauging device and saw blades from 46″ to 60″. Other machines are available for high-speed cutting of steel bars, billets, structural shapes, armor plate and miscellaneous forgings.

At your convenience, we shall be glad to give you more complete information about the design and performance of this profitable tool.

CONSOLIDATED MACHINE TOOL DIVISION
FARREL-BIRMINGHAM COMPANY, INC.
Rochester, New York
Plants: Ansonia and Derby, Conn., Buffalo and Rochester, N. Y.

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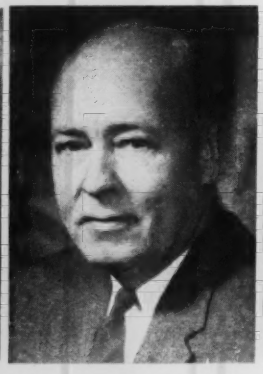
CONSOLIDATED ALSO BUILDS: Engine Lathes • Vertical Boring and Turning Mills • Floor and Planer-Type Horizontals • Planers, Double Housing and Openside • Planer-type Milling Machines • Plate-edge Planers • Vertical Slotters • Rotary and Straight-line, Production-type Milling Machines • Skin Mills for Aircraft Manufacturing • Railroad Wheel and Axle Machinery • Special Machine Tools.

RICHARD C. SIMPSON
Ducommun Metals v. p.

EDWARD I. BROWN
Vickers division eng.-dir.

JOHN R. GOWELL
Bostitch management post

CHARLES M. STAINTON
joins Controls Co. of America



ROBERT L. BRAMMER
Ackermann Mfg. president

LESTER J. MILLER
Green Fire Brick exec. v. p.

Duff-Norton Jack Div. and Coffing Hoist Div. in New York state and New England.

Charles M. Stainton joined **Controls Co. of America**, Schiller Park, Ill., as vice president and director of marketing. He was vice president and director of sales and planning for Robertshaw-Fulton Controls Co.

J. L. Adams, former sales manager, Reo Div., White Motor Co., was appointed director of sales, Owosso, Mich., division, **Midland-Ross Corp.** He succeeds **Harvey E. Schack**, former sales manager, who will devote full time to special sales, service, and engineering assignments.

Charles R. Gebel was made Pittsburgh branch office manager, electrode division, **Great Lakes Carbon Corp.**

James R. Connell was made purchasing agent at the Owego, N. Y., plant of **International Business Machines Corp.**

Robert L. Brammer was elected president of **Ackermann Mfg. Co.**, Wheeling, W. Va., subsidiary of Wheeling Steel Corp. He continues as manager, container sales division, at Wheeling Steel.

Lester J. Miller was named executive vice president, **A. P. Green Fire Brick Co.**, Mexico, Mo. He was vice president-operations.

William L. Sheehan will direct sales of **General Tire & Rubber Co.'s** new semirigid vinyl sheeting for vinyl-to-metal applications. His headquarters are at Jeannette, Pa., where the new material, Boltaflex "500," is in production.

H. M. Harper Co. named **John Mengel** central district sales manager, Chicago.

Victor Holt Jr., vice president-sales, was elected executive vice president, **Goodyear Tire & Rubber Co.**, Akron. Vice presidents elected are **C. C. Gibson, O. E. Miles, Sam DuPree** and **M. W. Laibe.**

Richard C. Simpson was elected a vice president, **Ducommun Metals & Supply Co.**, Los Angeles. He was director of marketing. His new duties will also include corporate development.

Edward I. Brown was made director of engineering, machinery hydraulics division, **Vickers Inc.**, Detroit. He was chief engineer, Torrance plant, Aero Hydraulics Div.

Bostitch Inc., East Greenwich, R. I., appointed **John R. Gowell** general manager of its stapling and stitching division; **J. Grandel Jones**, general manager of its container machinery division. Mr. Gowell joined Bostitch in 1954, and has served as assistant to the president and manager of manufacturing. Mr. Jones continues as controller.

Donald E. Cornmesser was made plant manager, Rubatex Div., **Great American Industries Inc.**, Bedford, Va.

Harry O. Walp Jr. was named product manager for vacuum heat treating furnaces, Vacuum Equipment Div., **F. J. Stokes Corp.**, Philadelphia.

Mearll K. Shetler was appointed central division sales manager, coated abrasives division, **Armour & Co.**, Alliance, Ohio.

Robert H. Weeks Jr. succeeds **George E. Stringfellow** as vice president and division manager, **Edison Storage Battery Div.**, Thomas A. Edison Industries, West Orange, N. J. Mr. Stringfellow continues as a vice president, active in trade relation interests of Edison Industries.

Edward M. Meyer was made assistant manager of western sales, **Bliss & Laughlin Inc.**, Harvey, Ill.

Jack W. Bosley was appointed manager-aluminum sales, **Hill-Chase & Co. Inc.**, Philadelphia.

OBITUARIES...

John N. Marshall, 60, chairman and chief executive officer, **Granite City Steel Co.**, Granite City, Ill., died Apr. 15. He joined the company in 1949 as chairman and later served for six years as president.

Edward M. Flannery, former vice president, **Dunham-Bush Mfg. Co.**, West Hartford, Conn., died Apr. 12.

When you need

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for exhaust of fumes and vapors...

FOR
STANDARD AIR
CORROSIVE GASES
ELEVATED TEMPERATURES

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4381

Armco-National Supply Merger Approved

Seventh largest U. S. steel producer and leading maker of oil field equipment become unified Apr. 30. Combined 1957 sales were $1977 million

MERGER of Armco Steel Corp., Middletown, Ohio, and National Supply Co., Pittsburgh, becomes effective Apr. 30. National Supply will retain its name, will be operated as a subsidiary of Armco.

Activities of the companies complement one another. Armco does not manufacture oil country goods, while National Supply, important in the oil equipment field, is a large user of steel without significant steelmaking capacity.

Why for National Supply—That last situation makes the deal attractive for National Supply. It now gets about 75 per cent of its steel bloom and skelp requirements from U. S. Steel Corp. and 25 per cent of it steel bloom needs from Crucible Steel Co. of America. Neither U. S. Steel nor Crucible need go above certain tonnage limits. National Supply has chafed at those restrictions, believing it lost some sales during good times.

Following consummation of the merger, National Supply eventually will get most of its steel from the Armco parent. Its contract with U. S. Steel will expire in 1964 and that with Crucible in 1962.

Why for Armco—The marriage makes Armco the fifth among the seven largest steelmakers to move into the attractive supply business. U. S. Steel, Bethlehem Steel Corp., Jones & Laughlin Steel Corp., and Youngstown Sheet & Tube Co. are the others. In addition to getting into the premium oil country tubular goods market, Armco enters the standard pipe and electrical conduit businesses, too.

The merger also indicates that Armco will be expanding markedly to meet National Supply's needs.

Expansion — Armco is benefiting from new equipment installed in the last few years. While some items in its expansion and improvement program have been postponed temporarily, the firm is not deferring any major project. "We are pushing ahead to completion the new hot strip mill at our Butler, Pa., Works and the rebuilding of the hot strip mill at Middletown," R. L. Gray, Armco president, says.

A new rod mill at Kansas City, Mo., a sintering plant and river terminal at Ashland, Ky., and a modication of the large plate mill at Houston are other projects being completed as rapidly as possible.

No changes in National Supply's personnel or policies are contemplated. When the merger becomes effective, A. E. Walker, chairman, and A. W. McKinney, president of National Supply, will join Armco's board of directors. John A. Mayer, executive vice president of the Mellon National Bank & Trust Co., Pittsburgh, also will become an Armco director.

Offers New Superalloys

Techalloy Co. Inc., Rahns, Pa., is offering new superalloys in wire, rod, and strip form for a variety of high temperature applications. These alloys, recently developed by International Nickel Co., include: Inconel "702," Incoloy "T," Incoloy "805," and Incoloy "901."

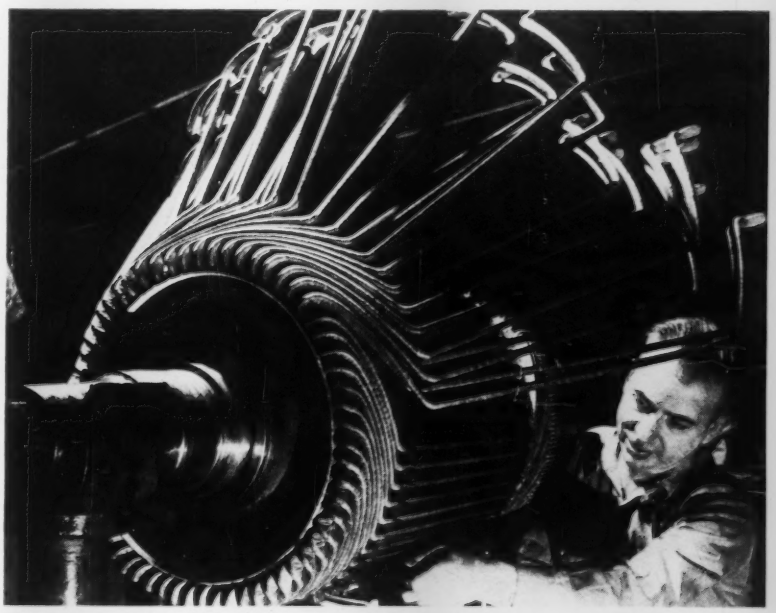
Mill Draws First Tubing

Wolverine Tube, a division of Calumet & Hecla of Canada Ltd., has placed in operation its $7-million nonferrous tube mill at London, Ont. The first length of copper tube was drawn on a three-tube "draw bench." The machine has a 60-ton capacity, is 320 ft long. The mill is also equipped with two additional draw benches, each capable of handling five tubes simultaneously and of exerting 18 tons of pull.

Plans Early Plant Opening

Target date for completion of a 50-ton per day iron powder plant has been moved up to "early in 1959" by Alan Wood Steel Co., Conshohocken, Pa. Originally (STEEL, Oct. 14, 1957, p. 93), officials believed at least 18 months would be

(*Please turn to Page* 86)



ARMATURE COILS are inserted into slots of direct current traction motor at General Electric Co.'s service shop in North Bergen, N. J.—one of 11 major repair centers the company has established across the nation for complete overhaul and rebuilding of industrial locomotives that weigh up to 120 tons each. Servicing those in use today (more than 15,000) represents an annual market potential exceeding $15 million, estimates H. F. McCullough, general manager of GE's Service Shops Dept.

NOW CF&I WIRE . . .

clean . . . convenient . . . compact . . . cuts costs

This new, revolutionary method of packaging keeps CF&I Wire free of rust and dust from the last pass on the drawing frame, through shipping and storage, until the sealed fibre drum is opened at your wireforming machines.

Each 600-lb. capacity fibre drum holds from five to eighteen miles of CF&I wire in *one continuous length*. It provides these cost saving advantages: • **Increased production (fewer set-ups)** • **Wire will not snag or kink** **Simplified storage (stack them)** • **Easier inventory control (count them)** • **Can be palletized for easy handling** • **Less scrap loss (no coil ends).**

Whatever your packaging requirements, or whatever your specifications for steel wire may be, check with CF&I. Our newly modernized and enlarged plants can provide fast delivery on high or low carbon steel wire . . . round, flat or shaped . . . in a wide variety of sizes, tempers, grades and finishes . . . in small quantities, carload or mixed carload lots.

WHEN YOU NEED WIRE . . . MAKE

IN FIBRE DRUMS

Here is a partial list of the many types of carbon steel wire manufactured by CF&I:

GRADES

low carbon
medium high carbon
high carbon
round
square
flat
shaped

FINISHES

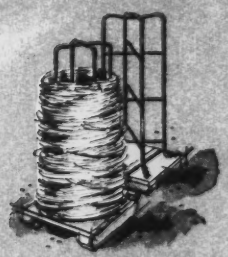
bright dry drawn or lime bright
bright grease drawn
cadmium coated
coppered
extra clean smooth bright
galvanized
liquor
white liquor
tinned

STANDARD TYPES (partial list)

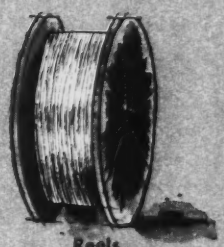
aircraft cord
bee
bobbin ring
bobby pin
bookbinder
broom
brush
casing
clip
concrete reinforcing
cotter pin
curtain spring
die spring
fine & weaving
fuse
Gamma spring
garment hanger
glass netting
hair pin
hat
hose, reinforcement
hose, mechanical
hose, vacuum
lock spring
lockwasher
manufacturers' drawn
mattress
merchant
nail
oil tempered
picker tooth
picture cord
pin ticket
regulator
rope
safety pin
screen
shaft, flexible
Signal Corps
snake fishing
spiral binding
spring
stapling
staple
stone
tie
twisted & laid
upholstery
valve spring
weaving
welding
Wissco Iron

Other CF&I standard packaging methods

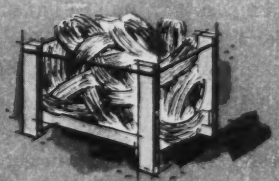
Steel-strapped coils (200- 2000 lbs.)



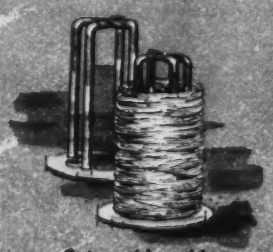
Non-returnable spiders (500-700 lbs. capacity)



Reels (500-800 lbs. capacity)



Steel-strapped wooden rack



Returnable spiders (2000-4000 lbs. capacity)

CF&I-WICKWIRE WIRE

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THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte Denver • El Paso • Ft. Worth • Houston • Kansas City • Lincoln • Oklahoma City • Phoenix • Pueblo Salt Lake City • Wichita • **PACIFIC COAST DIVISION**—Los Angeles • Oakland • Portland • San Francisco San Leandro • Seattle • Spokane • **WICKWIRE SPENCER STEEL DIVISION**—Atlanta • Boston • Buffalo Chicago • Detroit • New Orleans • New York • Philadelphia • **CF&I OFFICES IN CANADA:** Montreal Toronto • **CANADIAN REPRESENTATIVES AT:** Calgary • Edmonton • Vancouver • Winnipeg

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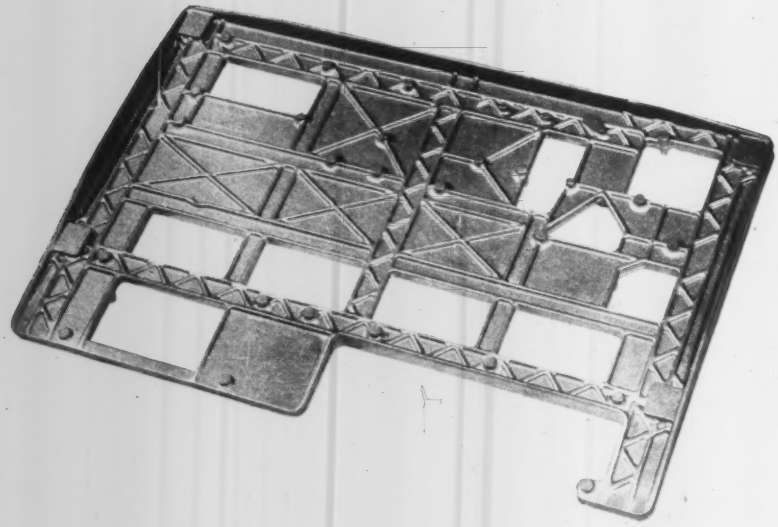


EXCELLENT BASE FOR PROFITS

This ninety-six pound casting was made for the National Cash Register Co. of Nodulite®, Hamilton Foundry's ductile iron. The casting forms the base for the new Post-Tronic Accounting Machine. It measures 37½" by 23½" with sections varying from ¼" to 1½". Ductile iron was chosen for this part because of its ductility, dimensional stability, rigidity, and machinability.

Sharp pencil buyers know that the *ultimate* cost of a casting rather than the purchase price is most important to the cost of the end product. Dimensional accuracy, uniform machinability, fine surface finish, low rejects and delivery of orders on schedule result in castings at lowest ultimate cost and insure your reputation for product quality.

When new and unusual design problems arise in the selection of metal and the casting of parts, you will find that the skill and integrity of your foundry is your best insurance that specifications—and delivery schedules—will be met.

GRAY IRON • ALLOYED IRON • MEEHANITE® • DUCTILE (NODULAR) IRON • NI-RESIST • DUCTILE NI-RESIST • NI-HARD

HAMILTON FOUNDRY

The Hamilton Foundry & Machine Co., 1551 Lincoln Ave., Hamilton, Ohio • TW 5-7491

(*Concluded from Page 83*)

required for the project. This has been shortened, as most engineering work has been completed and the site has been selected and approved. Start of construction of the plant adjacent to the steel works in Conshohocken is imminent.

Willys Sells Division

Willys Motors Inc., Toledo, Ohio, sold its Pressed Metals Div., Shadyside, Ohio, to Metropolitan Stamping Co., a subsidiary of International Harvester Co., Chicago.

Enlarges Abrasive Line

Manmade diamond abrasive wheels and hones have been added to the regular diamond abrasive line of Carborundum Co.'s Bonded Abrasives Div., Niagara Falls, N. Y. The company also announced that its Electro Minerals Div. has opened a Product Development Laboratory under the over-all direction of J. J. Forrester Jr., manager, Product Engineering Branch. M. F. Kiachif, manager, Product Development Dept., is in direct charge.

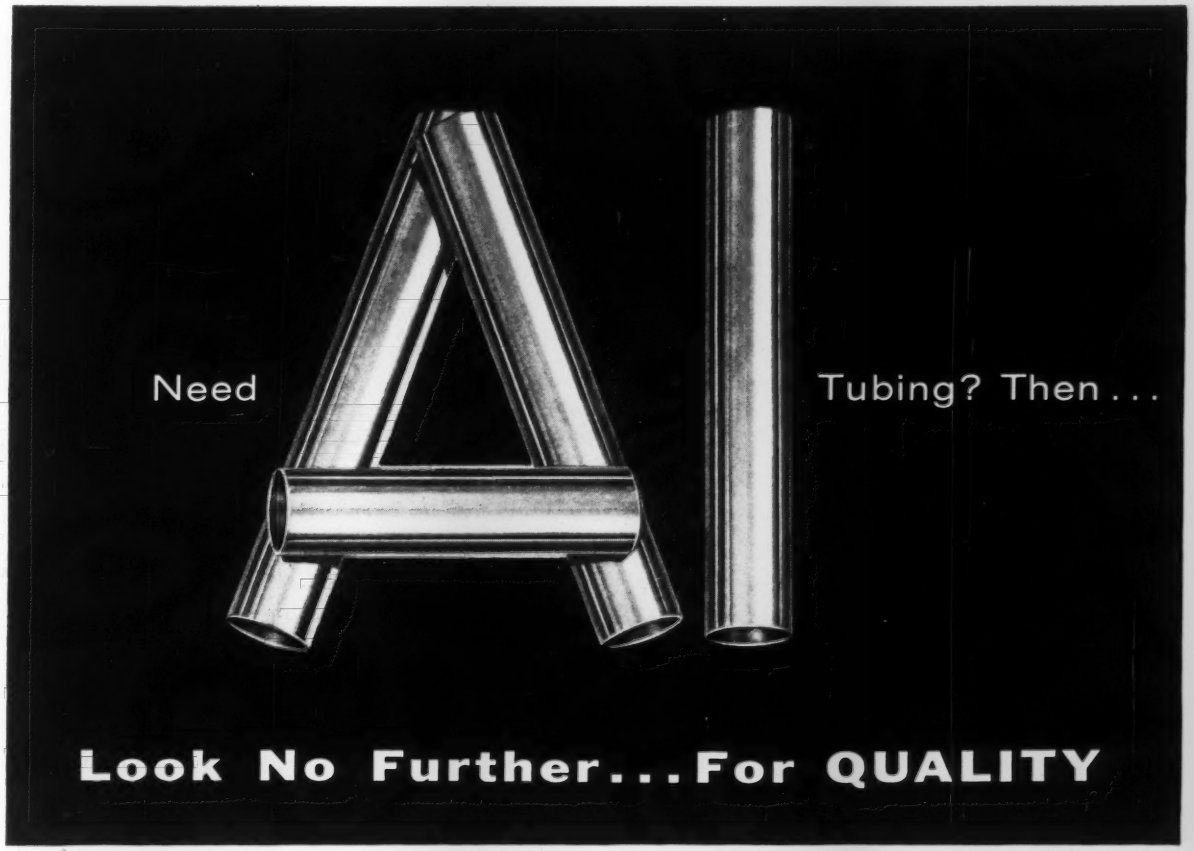
Metalworking Firms Grow

Expansion of the metalworking industry is moving forward despite the current lag in industrial activity. The slowdown has caused some postponements, but many others are being carried out as planned. Here are some expansion plans:

Rome Cable Corp. is adding new equipment costing about $8000 to its main plant at Rome, N. Y., to enable it to pierce, shape, and finish diamond dies. William E. Roux, formerly vice president of Roux Wire Die Works, Oriskany, N. Y., has been named to head Rome Cable's combined diamond and carbide department.

Electric Power Door Co., Minneapolis, plans to enlarge its production and warehousing areas by 60 per cent and to purchase $30,000 worth of new equipment.

Rapids-Standard Co. Inc., Grand Rapids, Mich., is building an addition to its plant. Besides increasing productive capacity of the plant, the project will trigger a series of moves involving the machine tool room, maintenance department, pressroom,



Because *BISHOP* small diameter tubing is not excelled in accuracy of I.D. and O.D. . . . in dimensional precision . . . in tolerances . . . in finish.

Whether it be for a precision part in an instrument . . . a heat exchanger in today's high speed aircraft . . . a thermocouple . . . an electronic or atomic application.

Wherever tubing is needed to meet corrosion, heat, shock, stress, psi pressure resistance and vibration . . . for highest quality and performance *specify* BISHOP tubing, at comparable prices.

Catalogs on Request. For Prompt Service, Fast Deliveries Call Malvern, Pa. 3100

SEAMLESS AND WELDED AND DRAWN STAINLESS STEEL TUBING

Mechanical, Capillary, Hypodermic and Aircraft Grade

(.008" to 1.000" O.D.—.003" to .083" Wall)

NICKEL AND NICKEL ALLOY TUBING

(up to .625" O.D.)

TUBULAR FABRICATED PARTS

Flanged, Flared, Milled, Slotted, Swaged and Threaded

GLASS-TO-METAL SEALING ALLOYS

CLAD METALS & COMPOSITE WIRES

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STAINLESS STEEL PRODUCTS DIVISION

J. BISHOP & CO. Platinum Works

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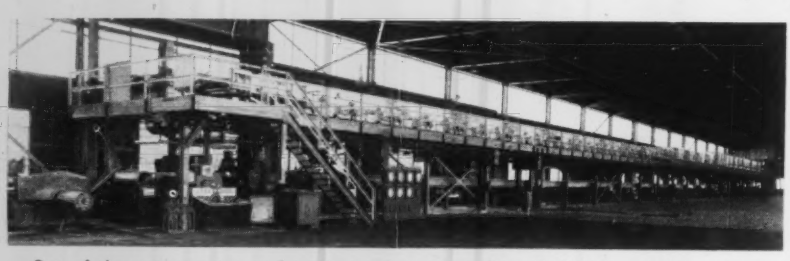
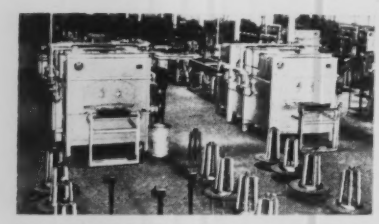
FURNACES *for Processing* Wire, Tubing, Strip and Other Products *Continuously*



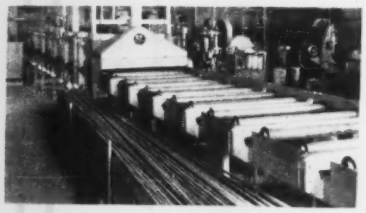
One of the numerous types of continuous furnaces we have built for processing various grades of silicon strip.

We are in position to design, build and put in operation: continuous equipment for hot or cold rolled, high or low carbon, stainless, silicon, tinplate, aluminum, brass, bronze or any other ferrous or nonferrous metal — for bright annealing, normalizing, galvanizing, aluminizing, tinning or any other process — in the size and type best suited to your plant, process, product or production requirements. No job is too large or too unusual.

Put your production furnace problems up to experienced engineers — it pays.



Installation of five EF special atmosphere continuous furnaces bright annealing stainless steel wire.



3000 lbs. of steel tubing, per hour, are bright normalized in this EF gas-fired radiant tube type special atmosphere furnace.

BULLETIN No. 461

shows typical installations of EF Gas-fired, Oil-fired and Electric Furnaces.

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THE ELECTRIC FURNACE CO.

GAS FIRED OIL FIRED AND ELECTRIC FURNACES FOR ANY PROCESS, PRODUCT OR PRODUCTION *Salem - Ohio*

Canadian Associates • CANEFCO, LIMITED • Toronto 1, Canada

offices, storage, and order selection. The firm makes conveyors, casters, and wheels.

Eastern Power Devices Ltd., Toronto, Ont., has completed an addition to its plant, increasing floor space to more than 130,000 sq ft. The expansion relieves crowding in the welding shop and provides area for new equipment being installed for Bonderizing and enameling.

CONSOLIDATIONS

American MonoRail Co., Cleveland, purchased **Tipp Mfg. Co.**, Tipp City, Ohio, producer of an overhead cable conveyor. Carl L. Sheets has been appointed manager of the Conveyor Div.; Joe Kohoot, assistant manager.

Dana Corp., Toledo, Ohio, purchased **Chelsea Products Inc.**, Chelsea, Mich., maker of gear boxes.

Micro Deburring Co., Chicago, acquired **Illinois Deburring Co.**, also of Chicago. All facilities are being consolidated at Micro's plant at 5827 W. Lake St., that city.

United States Chemical Milling Corp., Manhattan Beach, Calif., purchased **Hydro Metal Spinning Corp.**, Los Angeles, producer of precision parts and components for the aircraft and missile industries. The new operation will be housed in a plant under construction at Manhattan Beach.

Applied Research Laboratories, Glendale, Calif., has been consolidated with **Bausch & Lomb Optical Co.**, Rochester, N. Y. The subsidiary makes spectrochemical equipment in plants at Glendale; Lausanne, Switzerland; and London, England.

Gregory Industries Inc., Toledo, Ohio, purchased **J. D. Polis Mfg. Co.**, Chicago, producer of fasteners.

Province of Newfoundland, Canada, sold its interest in **Newfoundland & Labrador Corp.** to **Canadian Javelin Ltd.** and **Wabush Iron Co. Ltd.** Officers are: Chairman, H. G. Hilton (Steel Co. of Canada Ltd.); president, W. J. Williams (Pickands Mather & Co.);

Tough specifications? You bet.

That's why Maginniss Power Tool Company, leading producer of concrete vibrators, brought its tubing problems to Ohio Seamless. Our engineers recommended Ostuco NP-3 C1040 tubing for Hi-lectric Concrete Vibrator housings.

Here's what Maginniss says after using Ostuco NP-3 Tubing exclusively for 11 years, "*. . . only Ostuco NP-3 Tubing meets our requirements for abrasion resistance and easy machinability. Its fine grain structure cuts clean every time. Furthermore, we have never had a thread failure in the field traceable to tubing quality.*"

Every product, including yours, has materials or production process problems that are uniquely its own. If they involve tubing, Ohio Seamless has the answer. Just contact our nearest sales office, or the plant at *Shelby, Ohio—Birthplace of the Seamless Steel Tube Industry in America.*

AA-7477

SALES OFFICES: Birmingham • Charlotte • Chicago (Oak Park) • Cleveland Dayton • Denver • Detroit (Ferndale) • Houston • Los Angeles (Lynwood) Moline • New York • North Kansas City • Philadelphia (Wynnewood) • Pittsburgh Richmond • Rochester • St. Louis • St. Paul • St. Petersburg • Salt Lake City Seattle • Tulsa • Wichita

CANADA: Railway & Power Engr. Corp., Ltd.

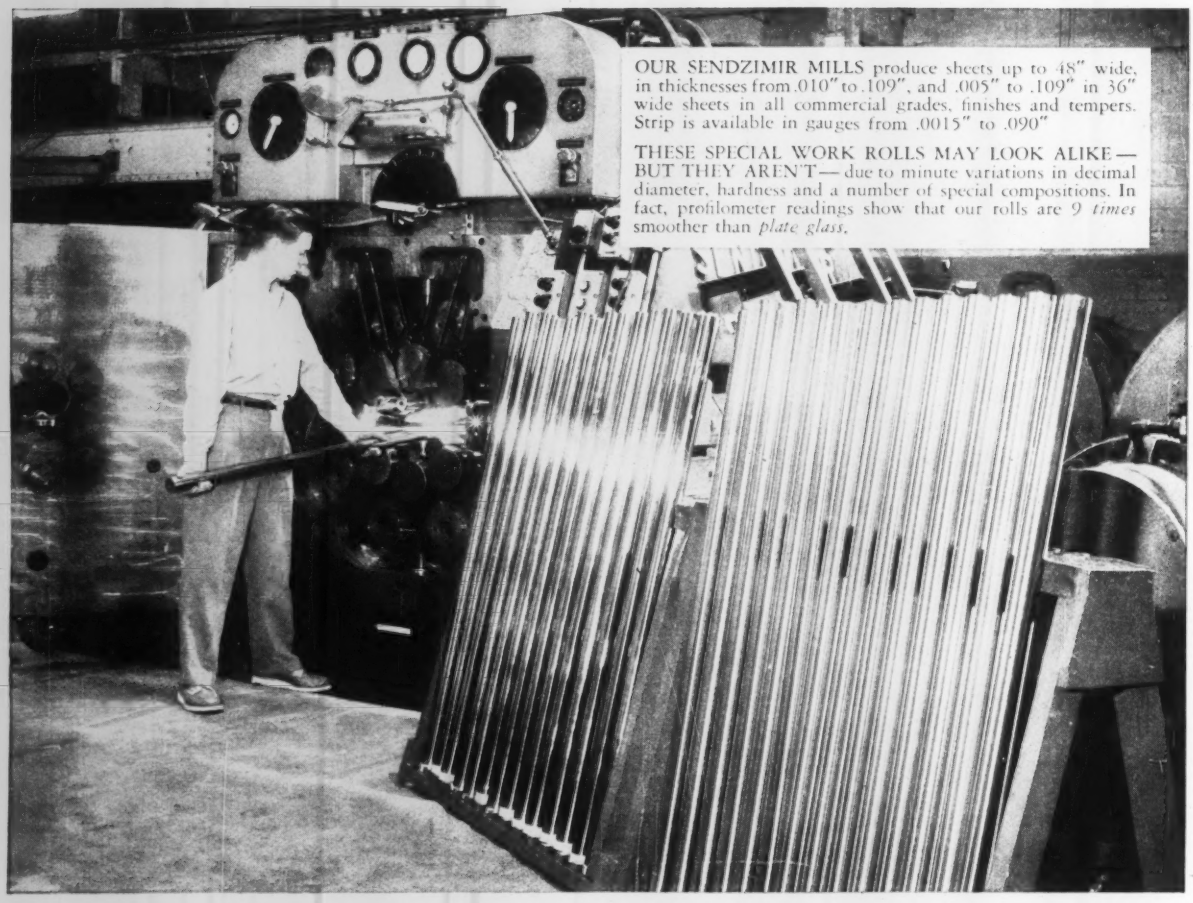
EXPORT: Copperweld Steel International Company
225 Broadway
New York 7, New York

FIFTY YEARS
OSTUCO SHELBY, OHIO
OSTUCO TUBING
1908 1958

OHIO SEAMLESS TUBE DIVISION

of Copperweld Steel Company • SHELBY, OHIO

Seamless and Electric Resistance Welded Steel Tubing • Fabricating and Forging



OUR SENDZIMIR MILLS produce sheets up to 48" wide, in thicknesses from .010" to .109", and .005" to .109" in 36" wide sheets in all commercial grades, finishes and tempers. Strip is available in gauges from .0015" to .090"

THESE SPECIAL WORK ROLLS MAY LOOK ALIKE — BUT THEY AREN'T — due to minute variations in decimal diameter, hardness and a number of special compositions. In fact, profilometer readings show that our rolls are 9 *times* smoother than *plate glass*.

It takes more than just a precision mill to produce STAINLESS STEEL *of MicroRold® quality*

. . . it takes Operating Know-How. Only Washington Steel, first to use Sendzimir sheet rolling, can offer you 10 years of practical experience with these mills.

Every hot-rolled stainless steel band has variations in thickness and surface characteristics which must be compensated for in the cold-reduction process to obtain precise gauge and flawless surfaces. To do this, special work rolls with minute diameter differences along the length of the roll are used in controlling such variations as crown, edge and camber. To accurately control all the possible variations requires a large number of these rolls, plus *highly skilled operators* who know from experience which rolls, speeds and reductions are required. These are but a few of important factors in quality rolling which can only be learned by *long* experience and association with precision mills.

Washington Steel is the only producer whose entire production stainless steel sheet and strip is rolled exclusively on the Sendzimir Mill.

WASHINGTON STEEL CORPORATION

4-0 Woodland Avenue • Washington, Pennsylvania

vice president, C. C. Huston; secretary, R. B. Taylor (Stelco); treasurer, E. C. Brunner (Pickands Mather); and assistant secretary, K. S. Benson (Pickands Mather).

ASSOCIATIONS

American Zinc Institute, New York, re-elected these officers: President, S. D. Strauss, American Smelting & Refining Co., New York; treasurer, G. H. LeFevre, U. S. Smelting, Refining & Mining Co., New York; executive vice president and secretary, J. L. Kimberley, New York. Vice presidents are: J. D. Bradley, Bunker Hill Co., San Francisco; Clarence Glass, Anaconda Sales Co., New York; H. L. Young, American Zinc Sales Co., St. Louis.

Lead Industries Association, New York, elected these officers: President and chairman, J. D. Bradley, Bunker Hill Co., San Francisco; and secretary-treasurer, Robert L. Ziegfeld. Vice presidents are: F. S. Mulock, United States Smelting, Refining & Mining Co., Boston; Felix Edgar Wormser, St. Joseph Lead Co., New York; and K. W. Green, Electric Storage Battery Co., Philadelphia.

Paul J. Washburn, Johns-Manville Sales Corp., New York, was elected president of the **Acoustical Materials Association**, that city.

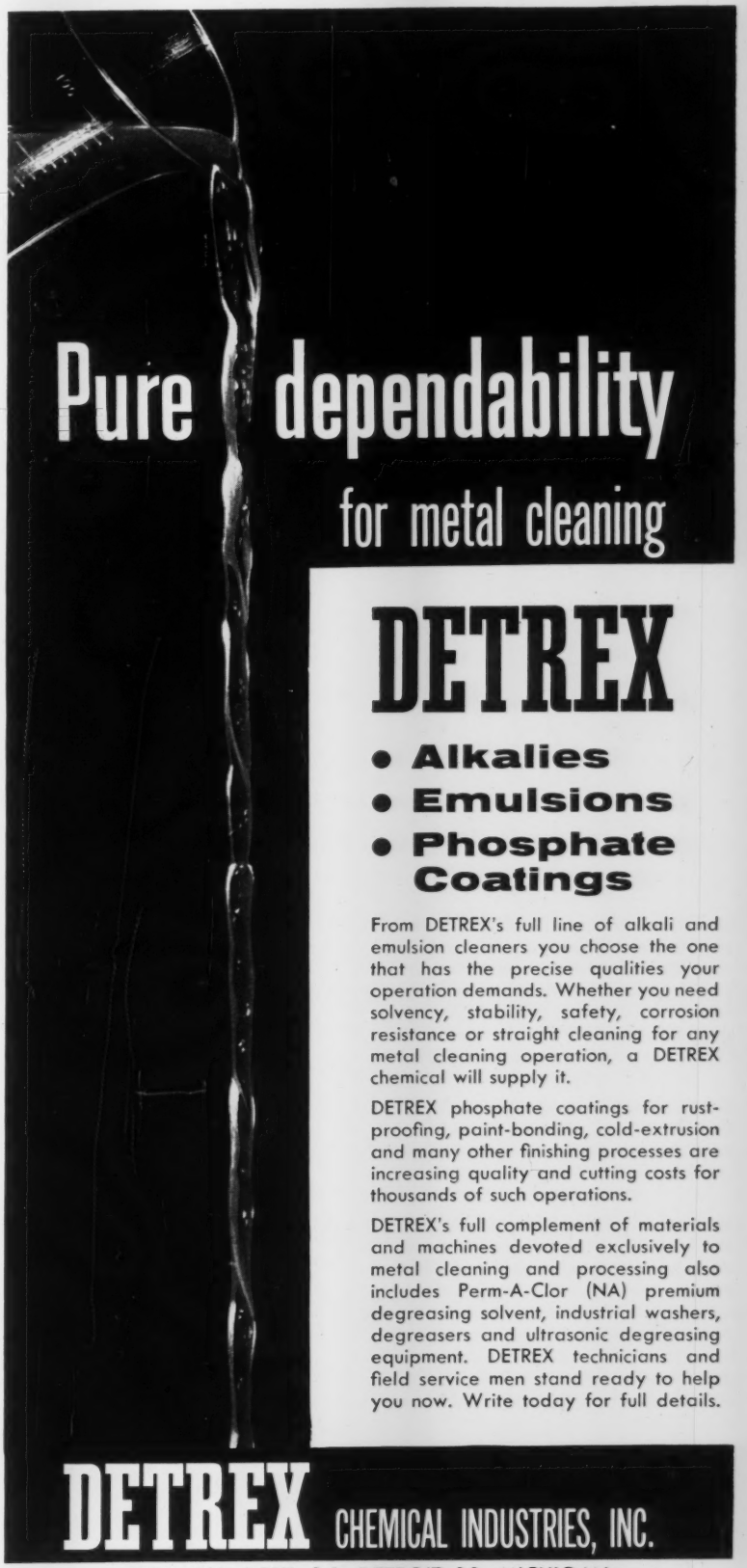
Prefabricated Home Manufacturers' Institute, Washington, changed its name to **Home Manufacturers' Association.**

NEW PLANTS

Zurn-Erie Corp., Erie, Pa., purchased the defunct Griswold Mfg. Co. plant in that city. Plans for rehabilitating the foundry are underway with production scheduled to start soon.

Chilton Metal Products Inc., Chilton, Wis., opened a $1-million plant in that city. The company moved to Chilton from Jackson, Mich., where it was known as Crippen Tool & Machine Co. It pro-

(*Please turn to Page* 94)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for metal cleaning
DETREX
• Alkalies
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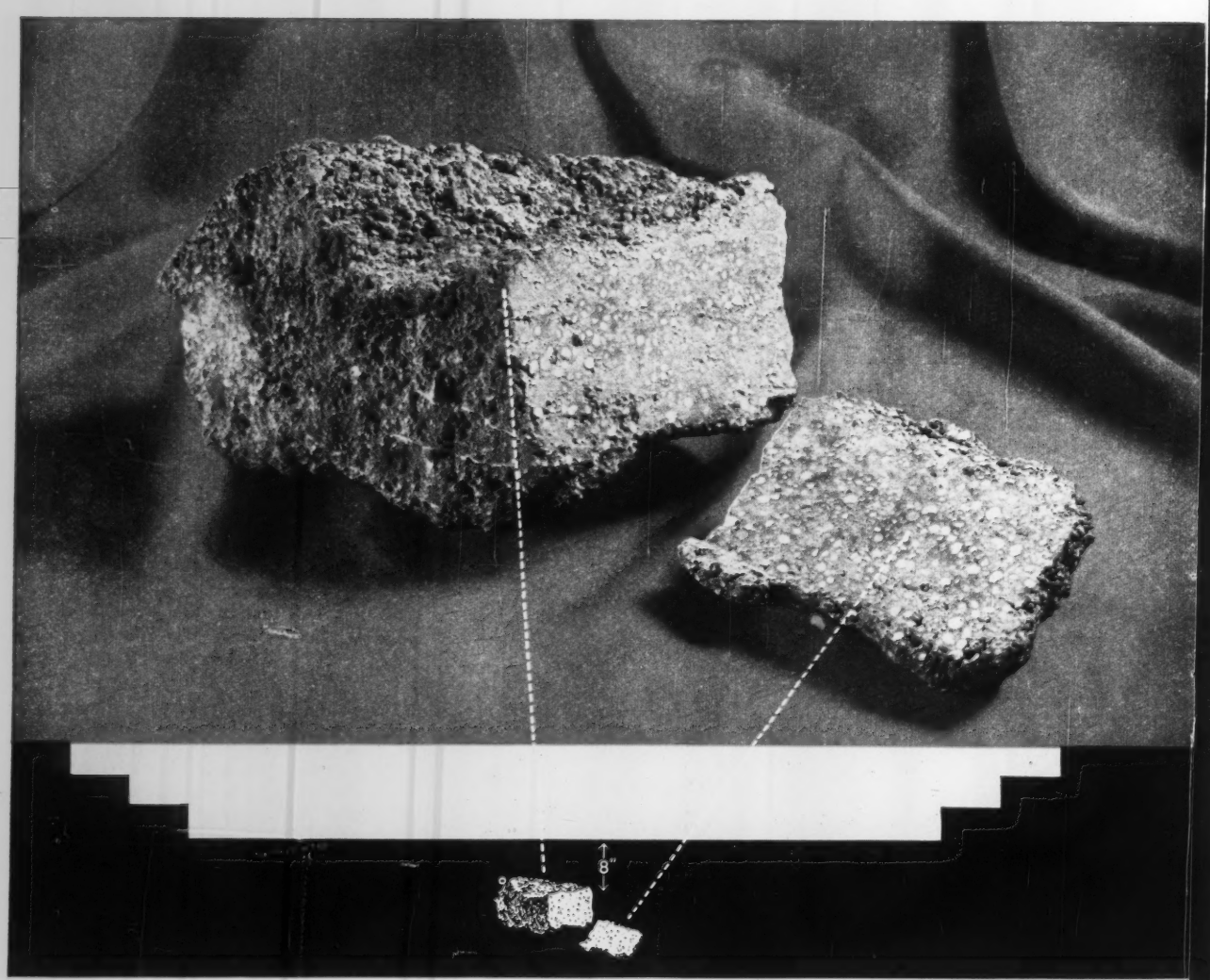
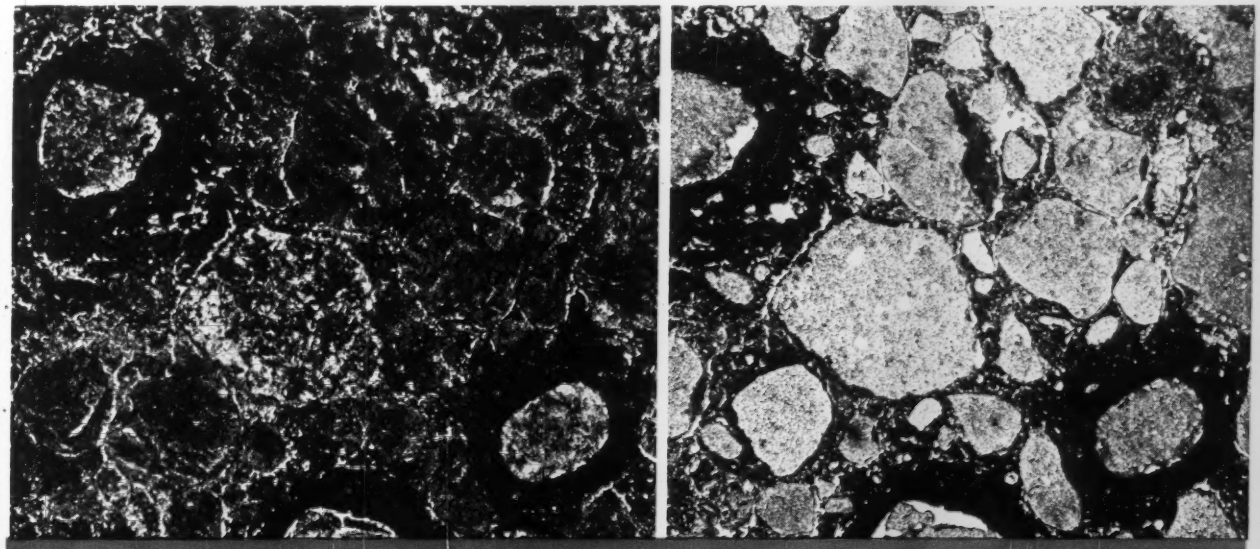
From DETREX's full line of alkali and emulsion cleaners you choose the one that has the precise qualities your operation demands. Whether you need solvency, stability, safety, corrosion resistance or straight cleaning for any metal cleaning operation, a DETREX chemical will supply it.
DETREX phosphate coatings for rust-proofing, paint-bonding, cold-extrusion and many other finishing processes are increasing quality and cutting costs for thousands of such operations.
DETREX's full complement of materials and machines devoted exclusively to metal cleaning and processing also includes Perm-A-Clor (NA) premium degreasing solvent, industrial washers, degreasers and ultrasonic degreasing equipment. DETREX technicians and field service men stand ready to help you now. Write today for full details.
DETREX CHEMICAL INDUSTRIES, INC.
BOX 501, DEPT. S-1, DETROIT 32, MICHIGAN

Permanente 165 Bottom
as tough as new
after 3½ years service



Unretouched photograph of actual specimens taken from 8 inches below working surface of Open Hearth bottom at center of furnace opposite #2 door. Furnace has 265 ton capacity and an operating rate of 10 hours and 45 minutes. 587,010 tons of regular carbon steel were tapped on this bottom.



These photomicrographs (enlarged 15 times) were taken from a thin section and show the mineralogical and textural characteristics typical of the complete specimen.

The coarser grains show no signs of having been altered or corroded during the 3½ years service period. The bond between coarser grain and matrix appears strong.

The fine matrix portion, although penetrated by calcium, has not been deteriorated. In fact, the filling of voids by calcium components tends to inhibit penetration of possibly more corrosive materials.

These specimens of Permanente 165 Ramming Mix were taken from eight inches below the rammed working surface of an Open Hearth furnace at a major steel plant. They were then submitted to Kaiser Chemicals research laboratories for chemical analysis and petrographic examination.

Here, briefly, are the findings of the laboratory tests:

1. The specimens are in excellent condition, with the components firmly bonded together.
2. Except for minor amounts of calcium and traces of other compounds, the specimens have not been significantly penetrated or contaminated by components of furnace charge or slag.

CHEMICAL ANALYSIS:

The results of the chemical analysis of the specimen are tabulated below:

Moisture loss (110°C for 2 hours)	0.24
Ignition loss (1000°C for 1 hour on dried sample)	0.92

	Analysis on Dried Basis	Typical Analysis
SiO_2	3.02	2.4
Cr_2O_3	0.94	1.0
Fe_2O_3	0.70	0.6
Al_2O_3	0.58	0.3
CaO	7.42	1.1
MgO (by diff.)	87.34	94.6
Na_2O	trace	
SO_3	trace	

These tests confirm once again the reasons why Permanente 165 Ramming Mix lasts longer than other materials . . . requires fewer repairs and less down time . . . helps produce greater tonnage at lower bottom cost.

Permanente 165 is made from high purity Kaiser Periclase refractory grains (94-96% MgO), and ceramically bonds itself into a crystalline mass at relatively low temperatures. This produces a bottom with maximum resistance to hydration and attack by iron oxide and slag. Its installed high density—averaging 175 pounds per cubic foot—assures longer life.

Why not ask your Kaiser Chemicals Sales Engineer to show you how this superior ramming mix can help you get greater steel tonnage at lower bottom cost?

Call or write Kaiser Chemicals Division, Dept. **R-8222,** Kaiser Aluminum & Chemical Sales, Inc., at any of the regional offices listed below:

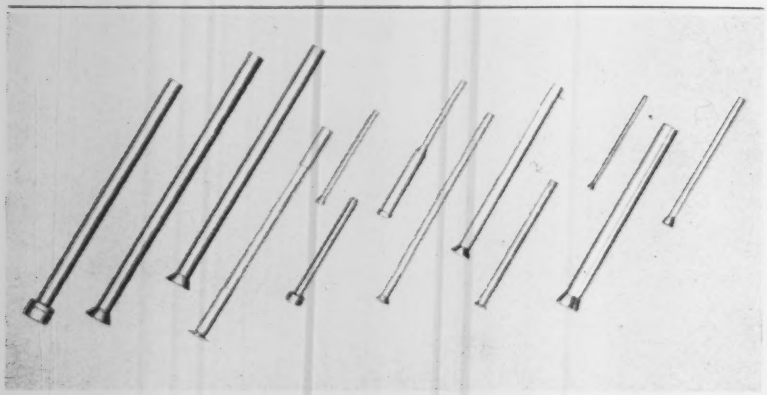
PITTSBURGH 22, PA. . . . 3 Gateway Center
HAMMOND, IND. . . . 518 Calumet Building
OAKLAND 12, CALIF. . . . 1924 Broadway

KAISER CHEMICALS

PIONEERS IN MODERN BASIC REFRACTORIES

REFRACTORY BRICK AND RAMMING MATERIALS • CASTABLES & MORTARS
MAGNESITE • PERICLASE • DEADBURNED DOLOMITE • ALUMINAS

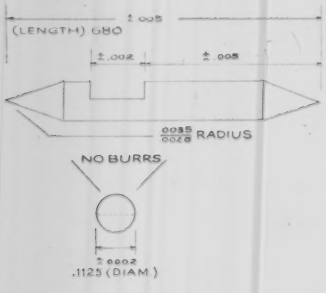
NEWS
from Torrington on
SMALL PRECISION METAL PARTS



Here at Torrington, our "Specialties" machines are constantly at work producing an endless variety of custom-built small precision metal parts. Our engineers help design many of these parts, at the same time developing the most efficient production methods to solve our customers' problems.

For example, one manufacturer recently needed perforating punches with an upset head (see photo above). His own facilities were inadequate for the job . . . specifications called for close body tolerance, grinding, precision heading, hardening and annealing. The punches were to be made from tool steel and produced without flash to allow proper seating. Torrington engineering and production facilities solved his problem.

Another—the volume production of timer parts with low cost a critical factor.



For this job, Torrington developed special high-speed equipment to provide automatic end turning and cross milling in a single operation. The result—a high-quality part produced at low unit cost.

Whatever the part, varying degrees of strength, ductility, hardness, toughness, magnetic or nonmagnetic properties are required to give it the exact qualities needed for its particular function. In Torrington's modern laboratories, highly

experienced metallurgists and engineers are employed to insure that each precision metal part is produced by the most efficient process and to the highest standards required for its application. They'll be glad to help you on all metallurgical problems.

If you have problems involving custom-built small precision metal parts in large quantities, write direct to

The Torrington Company, Specialties Division, 900 Field Street, Torrington, Conn.

TORRINGTON SPECIAL METAL PARTS

Makers of Torrington Needle Bearings

(*Concluded from Page 91*)

duces gasoline tanks for small engines and other sheet metal stampings.

Metal & Thermit Corp., New York, dedicated its new plant at Carrollton, Ky., which will make butyltin compounds. The company is celebrating its 50th anniversary this year.

Steel Sales & Service Inc., Lonsdale, R. I., plans to erect a 36,000 sq ft warehouse at Valley Falls, R. I. Flame cutting facilities will be enlarged and some additional lines will be added.

Campbell Chain Co., York, Pa., opened a warehouse at 559 W. Fulton St., Chicago 6, Ill.

NEW OFFICES

Miniature Precision Bearings Inc., Keene, N. H., opened a sales office at 21031 Mack Ave., Grosse Pointe Woods, Mich., to serve Michigan and the Toledo, Ohio, area. The office will be directed by P. L. Weinert.

NEW ADDRESSES

Ready Tool Co. moved its plant and main offices to 150 Garfield Ave., Stratford, Conn. The firm makes precision tool centers and grinding machine work holding devices.

DeVilbiss Co., Toledo, Ohio, moved its northeastern headquarters to 10 Stern Ave., Springfield, N. J. C. B. Gracely is in charge. The firm's Milwaukee sales office has been moved to 6915 W. Capitol Dr., that city.

Siegler Corp. moved its executive offices to 610 S. Harvard Blvd., Los Angeles.

American Can Co.'s Chicago headquarters were moved into a building at 200 S. Michigan Ave.

Dreyfuss Steel Corp. moved to larger quarters at Kearney-Mesa Industrial Center, San Diego, Calif.

Bridges, Power Plants, Mill Buildings

Fabricated on time ... as specified

just ... leave it to LEVINSON

Warehousers, fabricators, designers of steel for over half a century.

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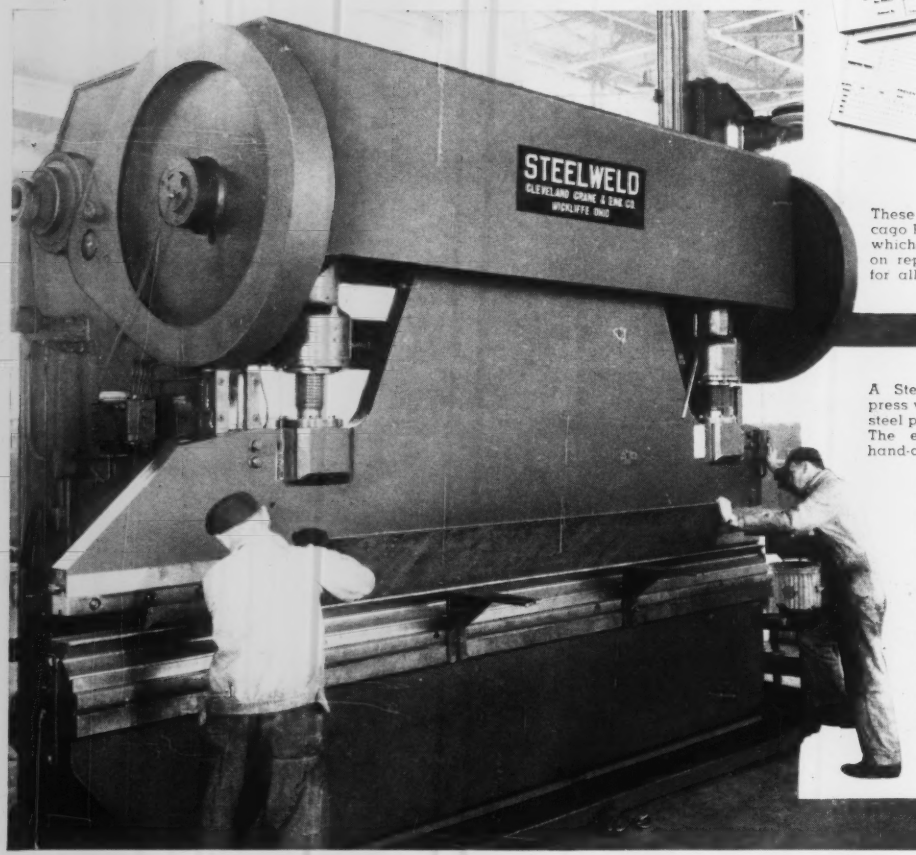
Accurate Records Prove
LOW COST OPERATION

These forms enable the Chicago Plant to develop records which provide concrete facts on repairs and maintenance for all machines.



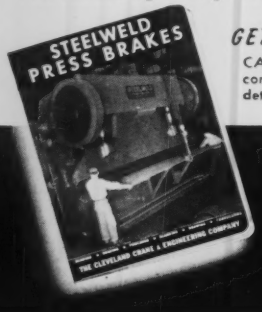
A Steelweld Model J4½-10 press working on various size steel plates up to 16'-0" x ¾". The ease with which the hand-cranked back gauge is adjusted is a favorable feature. The press is easily jogged in minute amounts. Shown is a 14'-0" x ¾" plate being formed for a hopper.

Link-Belt manufactures a wide variety of conveying and processing equipment such as apron, screw, oscillating and overhead chain trolley conveyors, railroad car dumpers, bucket elevators and other handling equipment.

SOME YEARS AGO the Pershing Road Plant of Link-Belt Company, Chicago, established a record system for keeping track of repairs and maintenance costs of all machine tools. This system provides a detailed history of maintenance required and lists every item of expense for every machine.

The record system proves that the maintenance cost for Steelweld machines, both bending presses and shears, is comparatively low.

Because of this, and the fact that Steelweld machines have many desirable operational features, a number of which are unavailable elsewhere, Link-Belt regards them highly. In fact, so much that 20 Steelweld Presses and Shears are now serving Link-Belt plants in nine cities.



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STEELWELD

PRESS BRAKES

BRAKING • FORMING • BLANKING • DRAWING • CORRUGATING • PUNCHING

Technical Outlook

SQUEEZE THAT STICKS—Researchers at Battelle Memorial Institute, Columbus, Ohio, report they're making progress on two methods of pressure cladding. In one, cores and covers are heated (1200 to 1500° F) and pressed together in hot dies. The other method uses gas pressures up to 100,000 psi. It is especially successful with brittle materials.

OUTMODED PIPING— Today's 2500 psi design standard for piping is obsolete, says William F. Crawford, president, Edwards Valves Inc., a subsidiary of Rockwell Mfg. Co., Pittsburgh. His reason: Equipment and processes are being designed for 4000 psi at 1200° F. He recommends that the standard be built around a 4500 psi value.

ELECTRIC SMELTING—N. H. Keyser, research metallurgist at Battelle Memorial Institute, Columbus, Ohio, thinks small steel producers and large foundries are ready for an independent source of 100 to 500 tons of hot metal a day via the electric smelting furnace. He expects power costs to soon become favorable for electric smelting in the U. S.

TANTALUM ON TAP—Demand for tantalum sheets has grown enough to encourage Fansteel Metallurgical Corp., North Chicago, Ill., to warehouse the uncommon material. Unannealed sheets in thicknesses of 0.002, 0.003, 0.005, 0.007, and 0.010 in. are available from stock.

HOT RECTIFIER—Westinghouse has developed a silicon carbide rectifier that functions at temperatures up to 1300° F. Its principal uses will be in electronic control equipment for rockets, missiles, and high-speed aircraft.

LOW EXPANSION CERAMICS—Two new ceramics for high temperature uses in which material expansion is critical have been developed by Corning Glass Works, Corning, N. Y. The lithium-aluminum-silicate materials can be formed in a variety of shapes by slip casting, hydraulic pressing, and extrusion. Potential uses include furnace linings for aluminum melting tanks, kiln furniture, crucibles, firing supports in industrial and laboratory furnaces, and calcining trays.

LIME POWDER STEELMAKING— ISRID, the French steelmaking research institute, has developed a process for refining pig iron by blowing it with a mixture of oxygen and powdered lime. It's adaptable to irons of any phosphorus and silicon content. Steels produced have low carbon, phosphorus, sulfur, and nitrogen contents.

SMALLER AND SMALLER— Makers of electronic parts are out to outminiature miniature control systems. RCA has a new device (shift register transistor) that replaces 20 transistors, 40 resistors, and 20 capacitors. It's expected to go a long way toward scaling down the size of computers like those used to control machine tools and equipment.

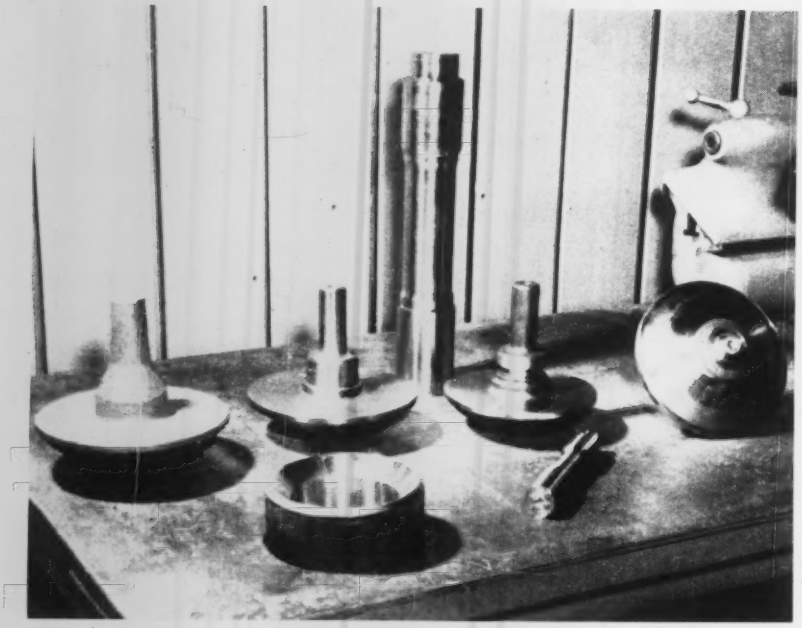
FEEDER DEBURRS PARTS— Syntron Co., Homer City, Pa., has come up with a new application for its vibratory part feeders—rapid, semiautomatic deburring of small metal stampings without deburring compounds. The vibration tumbles the parts over each other and around the axis of the bowl without damaging them.

NEW PLASTIC USE— Borg - Warner's plastic artillery cartridge has passed tests in a 105-mm howitzer. It withstands a momentary gas pressure of 35,000 psi and a momentary temperature of 4300° F.

TEMPERATURE HIGH NOTES— A ceramic, boron nitride, resists 3000° F, stands up to high temperature corrosion, has lubricating properties, and is easily machined, says Carborundum Co., Niagara Falls, N. Y. Look for applications in high temperature lubricants, bearings, gaskets and seals, and as a release agent in molds.

Metalworking Outlook—Page 49 Market Outlook—Page 133

JOB: Machine valve bodies and seats



OLD METHOD

Four Machines

Valve Bodies

10 operations

23 minutes

Valve Seats

3 operations

9.28 minutes

COST CRISIS . . . How To Beat It

Tracer Lathe Replaces

It reduces time needed to turn parts for oil field equipment. Saving is 6 minutes on one piece, 3½ minutes on another. The reject rate is 12 per cent below what it was

"OUR new tracer lathe cost us $55,000, but it will pay for itself in two and a half years," declares Owen U. Trumbull, tool engineer at National Supply Co., Toledo, Ohio. Savings come to $22,000 a year.

In terms of production, several gains were made in rough and finish machining valve bodies and seats for oil well slush pumps:

- Less operational expense (the lathe replaces four machines).
- Greater output (fewer operations and less time are required to complete a part).
- Fewer rejects (rate is down 12 per cent).

Forged Part—The valve bodies are machined from forged carburizing steel. The forging is chucked and finished completely on one end. The rear carriage rough faces the end; then the tracer arm contours the part.

The second operation is to machine the opposite end. The rear carriage is used to rough face the back of the flange, and the tracer arm is used to contour the part. Then the part is carburized.

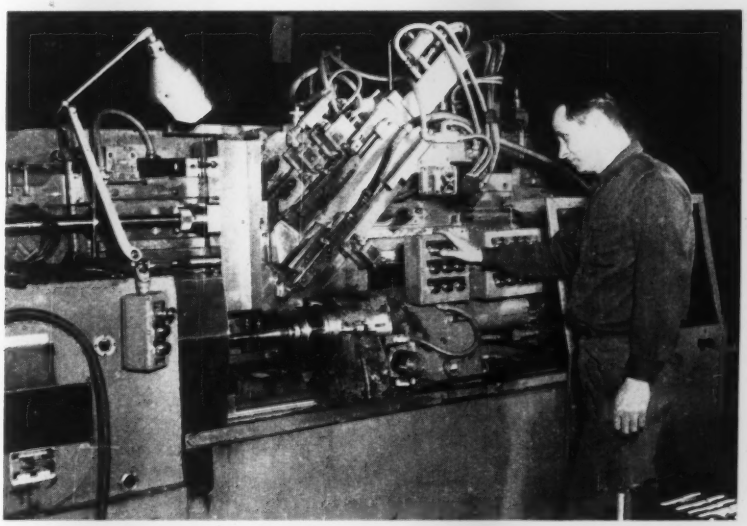
In the third operation, the carburized stock is machined off the pilot end. The fourth operation involves remachining the stem end. The rear carriage faces the flange and forms a groove in the stem.

Made from Tubing—The valve seats are machined from AISI A 4150 seamless tubing. The tubing is chucked in the machine and bored to size by the rear slide. The tracer arm forms the 45-degree seat.

Extra Time Available—The increased production on the valve parts creates free time on the ma-

NEW METHOD

One Bullard Hydra-Feed Tracer Lathe



4 operations

17 minutes

2 operations

6 minutes

Four Machines

Saved: $22,000 a year

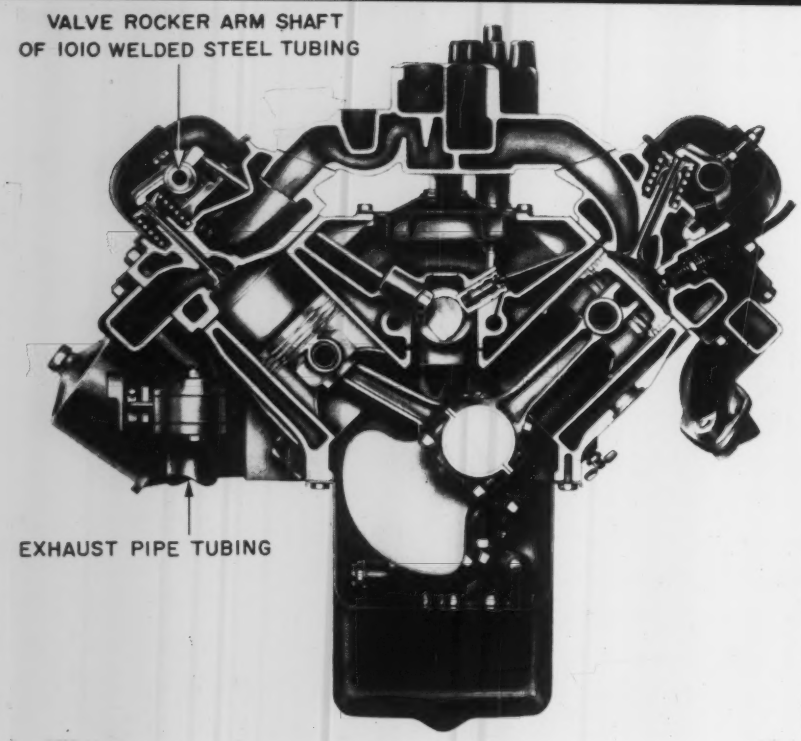
chine. National Supply is using it to produce high-nickel studs for steam turbines.

The studs are a 44 per cent nickel, 18 per cent chrome, 12 per cent molybdenum alloy. The parts are run between centers, using the driver buttons on the head stock spindle. Only the tracer arm is used in turning down the parts. A 32 microinch surface finish is held.

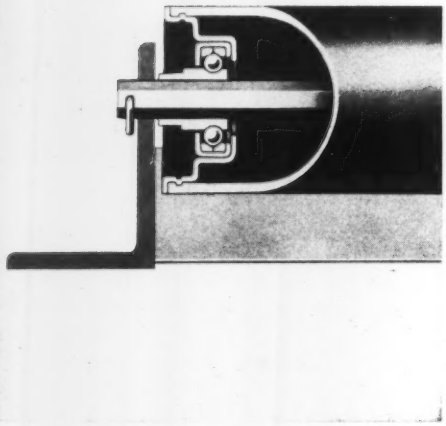
"The Bullard Hydra-Feed tracer lathe was built special for us, exactly the way we wanted it," explains Mr. Trumbull. "It is fully automatic and has a variety of feeds that can be adjusted to fine or coarse cuts. It requires a minimum of setup time."

COST CRISIS COMPETITION

This article is part of a campaign to help industry achieve lower unit production costs. The accompanying example and others to follow are samples of what the editors of STEEL are looking for in their nationwide search for companies that have brought about important cost savings through more efficient use of capital equipment. Does your company qualify? If so, enter the Cost Crisis Competition. Write to the Cost Crisis Editor, STEEL, Penton Bldg., Cleveland 13, Ohio, for your awards kit.



1 Cutaway of Chrysler Firesweep engine shows uses of welded steel tubing as valve rocker arm shaft and exhaust pipe. Other uses: Shock absorber cylinders, propeller shafts, seat back frames, rear axle housing



2 Welded steel tubing for conveyor rollers offers maximum strength at reduced weight and lower

Four Ideas for Using Welded Tubing

The versatile material has been designed into automobiles, conveyors, small tools, and magnetic separators. Advantages: Economy, ease of fabrication, and high strength

DESIGN versatility is a big selling point for welded steel tubing. Imaginative designers are specifying it as a structural material in products ranging from small hand tools to autos.

Here are four examples of the material's value in solving design problems:

1 Chrysler Corp. engineers are designing it into many parts for their new models. In practically all applications, it has replaced other materials at reduced cost. Performance is equal or better.

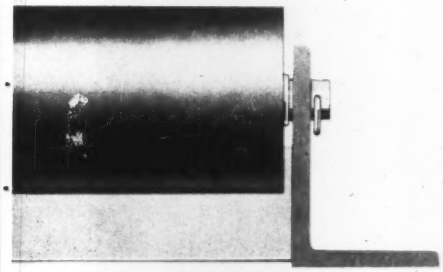
What automen like about the welded tubing: Its high degree of concentricity and uniform wall thickness, which makes for good balance in rotation; its availability in a wide range of sizes; its economy in forming and machining; and its high strength to weight ratio.

For most auto uses, 1010 carbon steel meets weldability and formability requirements. Sometimes it is necessary to go to a 0.30 carbon grade to get higher strength.

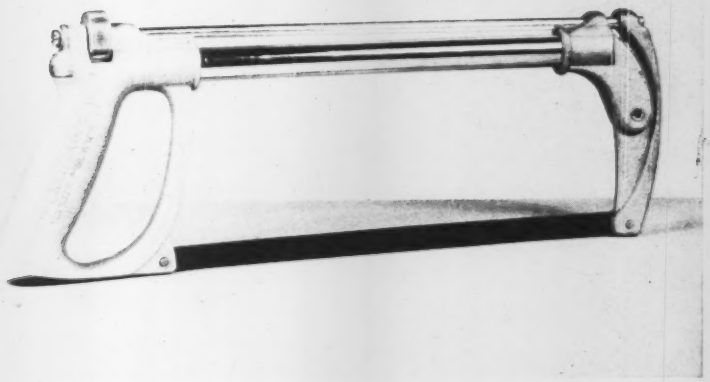
Some of the places where you will find welded steel tubing: Shock absorber cylinders, hydraulic steering gear tubes, propeller shafts, seat back frames, crankcase outlet pipes, valve rocker shafts, exhaust pipes, fuel tank filler tubes, oil cooler tubes, fuel line tubes, and water pump inlet elbows. The rear axle housing is also made of welded steel tubing.

2 Two conveyor manufacturers have joined the ranks of welded tube users. May-Fran Engineering Co., Cleveland, maker of hinged steel belt conveyor systems, redesigned a hinge or connecting pin for 1030 grade tubing. Logan Co., Louisville, uses 1020 welded steel tubing for rollers and frame ties in its light duty and portable stock roller conveyors.

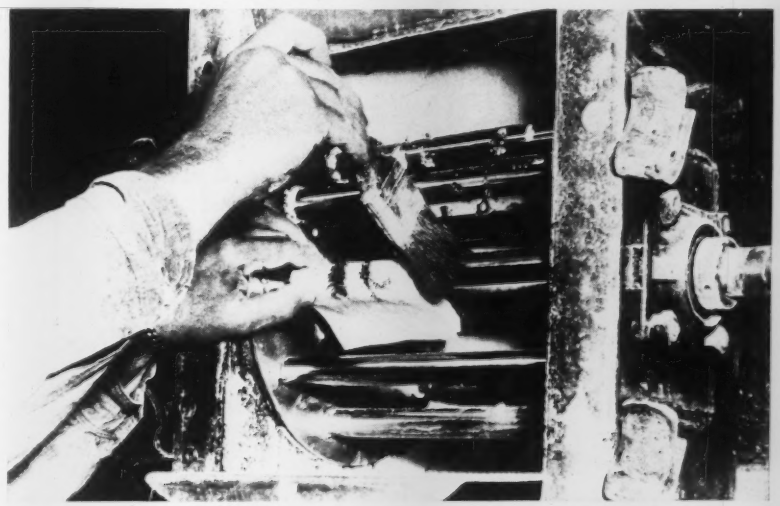
In the May-Fran conveyor, the tubing replaced a solid pin which had turned and shouldered ends. The assembly now has an outer sleeve of welded tubing which acts as the hinge pin and a smaller di-



fabricating costs. Tubing is used as-received from mill, cut to length, deburred, and fitted with formed caps



3 To resist bending strain and torsional stresses, the backbone of this hacksaw is made of welded steel tubing to provide maximum strength and minimum weight. Spare blades can be stored in the tube



4 Nonmagnetic welded stainless tubing is used in permanent magnetic separator which removes unwanted bits of metal from moving streams of materials. Tubing is ordered to exact size to limit shop operations

ameter straight-through connecting pin. The conveyor manufacturer says the redesign eliminates the turning operation, allows easier assembly, and reduces hinge wear because of larger diameter hinge tube. Another advantage: Heavier wall tubing can be used when the application requires higher strength.

To make the rollers for the Logan unit, the tubing is cut to length and the ends fitted with formed steel cups. Ball bearings and through steel shafts are inserted to provide a free-running roll assembly. In smaller sizes, the cups are omitted and flanged ball bearings are fitted into the ends of the tubes.

3 A newly designed hacksaw, being produced by Dreier Bros. Inc., Chicago, has a backbone of welded steel tubing. Cast aluminum parts are used for the end sections.

The tubular form offers an ideal member to resist bending strain (horizontally and vertically) and torsional stresses. An added benefit is the lightness of the tubing.

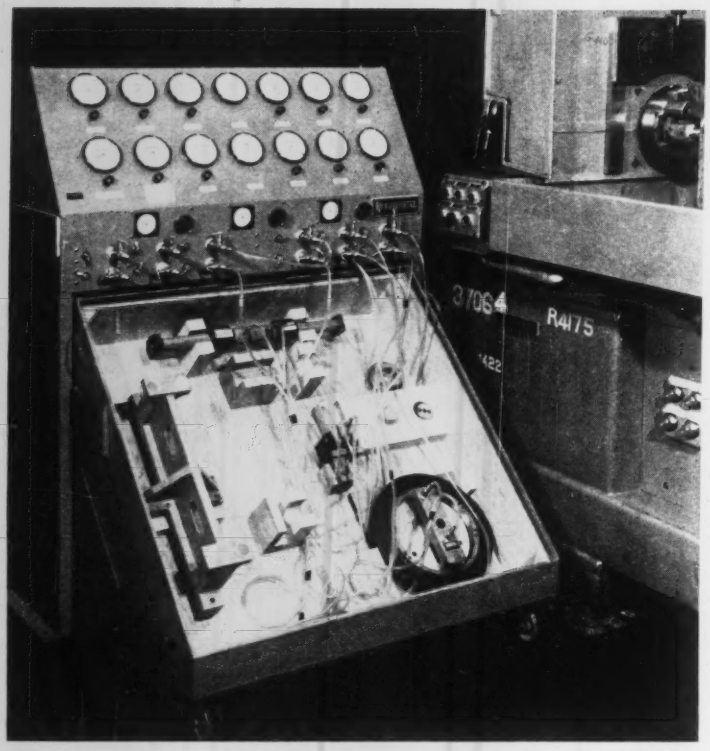
A unique feature of the tool is the storage chamber for extra blades formed by the hollow backbone.

Dreier Bros. uses 11/16 in. diameter, 1020 grade steel, with a 0.042 in. wall thickness. The surface of the cold-rolled tubing is adequate to permit chrome plating without additional finishing.

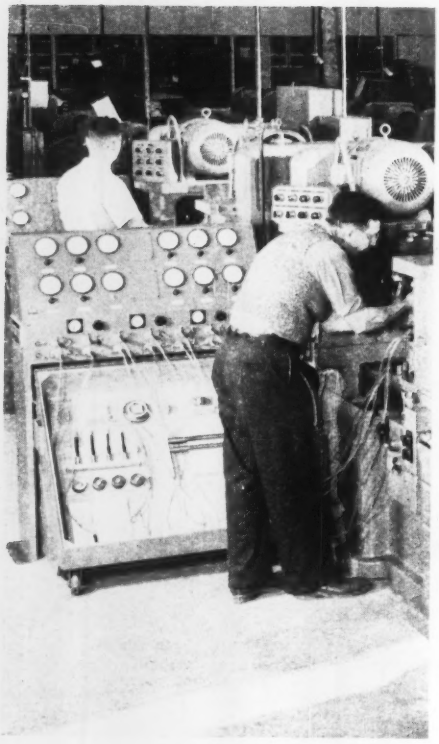
4 Type 304 stainless tubing is being used in a permanent magnetic separator because of its economy, its noncontaminating characteristics, and its nonmagnetic properties. Built by Eriez Mfg. Co., Erie, Pa., the separator is used to extract tramp iron and steel from such materials as gypsum, lime, and cohesive chemicals.

The use of the nonmagnetic welded tubing prevents interference with the functioning of permanent magnets inserted in each tube. The net effect of the magnets is to provide a continuously strong magnetic field along the entire length of the tube. If the tube were made of a magnetic material, the field would be strong at the ends but weak in the center.

Eriez Mfg. uses standard, 1 in. OD, cold reduced, welded stainless tubing. It is ordered to exact size which limits shop operations to cutting to length and deburring.



Air gages are plugged into a specially built console to check missile guidance gimbals. Each console is built to work with six different gage sets that handle the variety of workpieces



Other parts are machined on these Ex-Cell-O boring machines with the same gaging cart-console concept

Gage Carts Cut Setup Time

Wooden racks, mounted on casters, hold the gaging elements for different parts. The racks are wheeled to the machine, and elements are simply plugged into special consoles

SUPPOSE YOU have six different workpieces, each with countless dimensions that must be gaged accurately. Extreme tolerances make it mandatory to keep the gages at the machine, so the operator can check as he goes.

How do you store the gage elements so they're handy when they're needed, out of the way when they're not?

One solution is to put them on mobile carts, says the AC Spark Plug Div. of General Motors, Milwaukee. When the gages are needed, the cart is wheeled to the machine. It is returned to storage when the job is done.

Variety—Gage carts are used by a department that turns out six different gimbals for guided missiles. Heald Borematics bore, chamfer, face, and groove the aluminum castings. A normal tolerance runs 0.0005 in. in 20 in. for parallelism and squareness. It means holding 40 millionths on many of the bores.

Each gimbal requires 12 gaging setups, four each for roughing semi-finishing, and finishing. The setups at each stage are:

1. Gage to check alignment of the boring heads to the locating fixture on the first axis.

2. Gage to check concentricity and bore diameters. The gimbals average 200 to 225 bores per part.

3. Gage to check alignment of

the boring heads to the locating fixture on the second axis (90 degrees from the first).

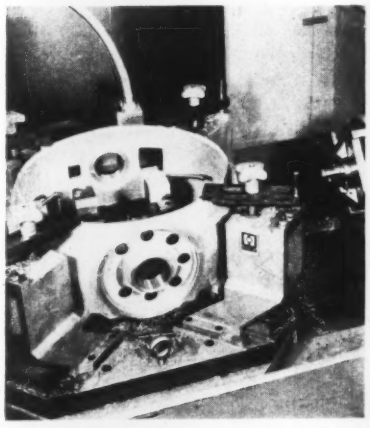
4. Gage to check concentricity and bore diameters on the second axis.

Versatility on Wheels—Gaging is identical on the semifinish and finish operations. The alignment gage setup can be used on any of the Healds. Four of the machines have specially designed air gage consoles made by Federal Products Corp., Providence, R. I. One is for semifinishing the first axis. Others are for: Semifinishing the second axis, finishing the first axis, and finishing the second axis.

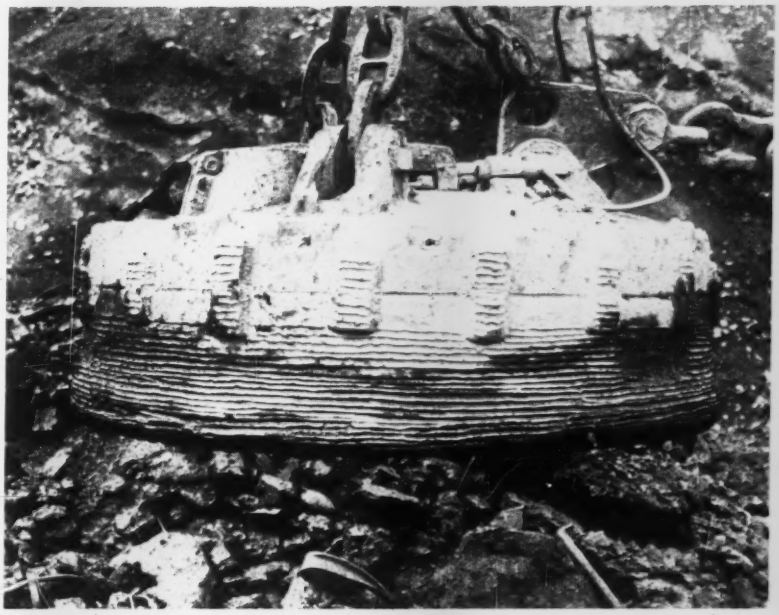
Since each console (and machine) must work on six different gimbals, the number of gaging elements is too great to keep them all at the machine.

The consoles are designed for plug-in setups. The department has 13 wooden carts, each carrying the gage elements for a complete setup. When the operator is ready for a new job, he simply disconnects the gages he has used and wheels the cart to a nearby storage area.

The cart fits under the console. The operator puts it in place and plugs the air hoses into the console. He can complete the full gaging setup in about 1½ hours. Alex Damske, AC's tool engineering department, estimates that other gaging methods would take about 6 hours.



This gimbal support is one of six parts that has to be processed in the boring machines. Bore, face, chamfer, and groove operations require critical tolerances and alignment



Slag dump recovery operations put equipment to the toughest kind of tests. This electromagnet is resurfaced once a week. Beads are laid with a chromium carbide electrode

Hardsurface Cuts Downtime

Applied to heavy wear points, overlays of supertough alloys increase part life more than two or three times. You can choose types to resist shock, abrasion, or corrosion

WITHOUT hardsurfacing a lot of heavy duty field equipment wouldn't be economical to operate.

One of the best examples is machinery used to recover steel from slag dumps. Slag is more abrasive than lava rock. Interlaced with iron and steel, it takes the "stuff" out of the toughest manganese steel in a short time. Even with resurfacing, a Pittsburgh reclamation firm can get only a week's service from the drag line bucket teeth and crane magnets. Without such treatment, equipment life would be measured in hours.

Values—Depending on the resurfacing material used, you can lay down hardsurfacing with an electric arc for 50 cents to $1.25 per cu in.

Lincoln Electric Co. engineers (Cleveland) point out that the biggest savings are in downtime. They are closely followed by reduced replacement costs—hardsurfacing increases wear life at least two or three times.

Application—You can hard surface easiest in a weld shop. Field application can be handled with an engine driven generator mounted on a truck. It saves dismantling, loading, and transporting parts. Downtime is also reduced. Be sure to include oxyacetylene torches and chain hoists, which are helpful in handling heavy components.

Most large steel companies and many commercial welders regularly use such portable equipment.

Design—Wear surfaces are protected by plates, strips, or beads of hardsurfacing material. Much outdoor equipment is resurfaced with semiaustenitic electrode material. A chromium carbide type is used on heel surfaces and on electromagnets.

A Study in Technological Obsolescence

Projected cost figures for the Lee Wilson opened coil recuperative annealing system.

COSTS PER TON	Open Coil	Cover Type 4 Stack
Operating costs per ton: Labor, fuel, utilities, atmosphere gas	0.81	1.22
Maintenance costs per ton: Repairs, replacement, preventive maintenance	0.17	0.82
Interest and depreciation: Ten years at 6 per cent interest	0.90	2.17
Total amortization cost per ton	$1.88	$4.21
Savings per ton	**$2.33**	
CAPITAL COSTS		
Furnaces	$900,000	$1,078,200
Buildings, cranes, and installation	252,500	1,429,000
Steel inventory in process	48,000	604,800
	$1,200,500	$3,112,000
Capital savings	**$1,911,500**	

Annealing Costs Tumble

Pilot plant figures on a radical new annealing system for drawing quality steel show steel plants another way to beat the cost crisis. Ties up only 18 coils

OPENED coil annealing just revealed by Lee Wilson Engineering Co. Inc., Cleveland, is reputed to save more than $2 a ton on annealing costs. A full scale pilot plant has shown that it can anneal cold rolled steel at a third the capital investment and ten times the speed of a typical 4-stack system. The savings over single-stack annealing are almost as impressive.

Surface the Key—A typical 27,000 lb coil, (0.036 in. gage, 40 x 60 in. diam) tightly wound as it comes from the cold mill, presents only 84 sq ft of surface to annealing gases. Lee Wilson has found a way to open the coil and keep it opened so that it presents 36,000 sq ft of surface area (about 400 times as much).

A complete system for opening coils, cleaning, annealing, cooling, and closing the coils can be housed in a 110 x 50 x 12 ft high building —5500 sq ft of floor area against 23,000 for a cover type 4-stack system capable of annealing 20 tons an hour.

Quality?—"The steel will be better too," says Lee Wilson, president of the company. "Mills can forget about stickers. There aren't any with the opened coil system."

Heating is uniform throughout the coil, so that hardness scarcely varies across the sheet. Better surfaces can be obtained because the steel can be vapor cleaned in coils under conditions which prevent carbon deposits.

Final hardness can be closely controlled. The system was designed for soft drawing quality steels. It may be applicable later to hard annealing, but will not be pushed for it, at least at first.

How It Works—Coils fresh from the cold mill are upended on a rotating table and the strip fed around a tension roll to a vertical coiling reel. As this reel re-coils the steel, a nylon string is interleaved with it. When the expanded coil has been formed, the string is pulled out, leaving the turns separated by the thickness of the string.

The opened coil remains on its side throughout the rest of the process. First it goes to a station where cleaning can be accomplished by dip, vapor, or hot gas methods.

Annealing Furnace — Ready for annealing, the coil is moved on a platform into a purging chamber where air is driven out of it. It then moves into the rotary hearth furnace.

The furnace has seven zones: Two preheating, two heating, one soak, and two cooling. A recuperative system transfers heat from the cooling to preheating zones. The furnace indexes on a time cycle of one zone every hour (or less depending on coil thickness).

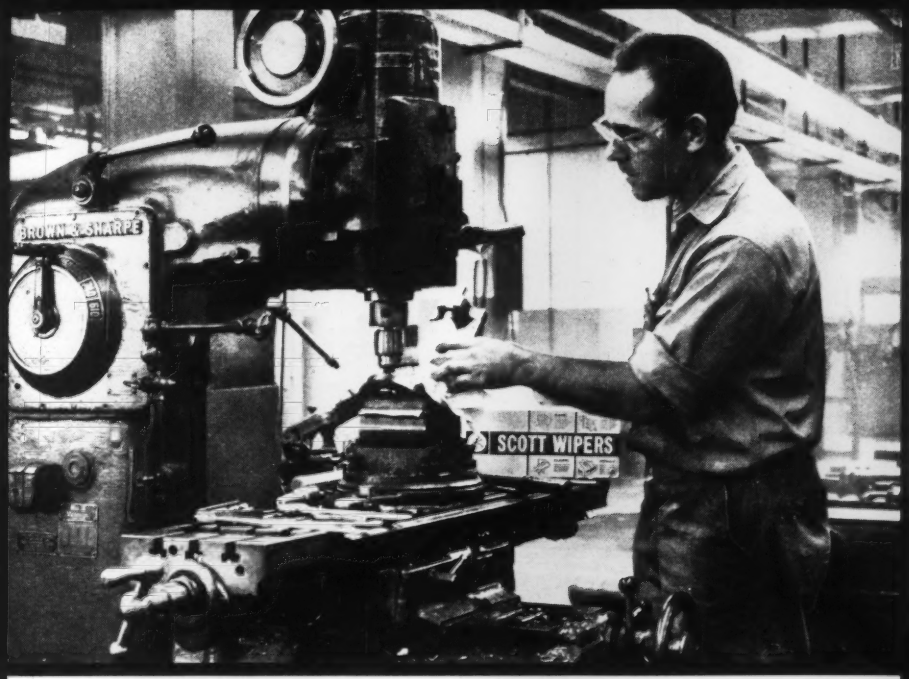
The full seven-hour cycle delivers the coil from the furnace cool enough for rewinding and immediate temper rolling. Annealing rate is about one coil—or 25 tons—of steel an hour.

Old Idea—The principle of opening coils for annealing has been thought of many times before and has been done successfully with hot rolled coils. The trick was to make the idea work with thin strip. Lee Wilson solved it with a combination of tricks: Upend coiling, tension, a special base that stays with the coil, and the removable string.

But the coil was only the beginning. A radically new furnace and coil handling system had to be designed to make the idea practical.

Inventory Cut—One of the largest savings is the small number of coils in process. The system ties up only 18 coils. In contrast, a 4-stack system would tie up 240 coils and a single-stack system close to 200.

"Selling these coils would bring $500,000," says Lee Wilson. "That leaves only about $600,000 more needed for the system, and that could easily be amortized in less than three years."



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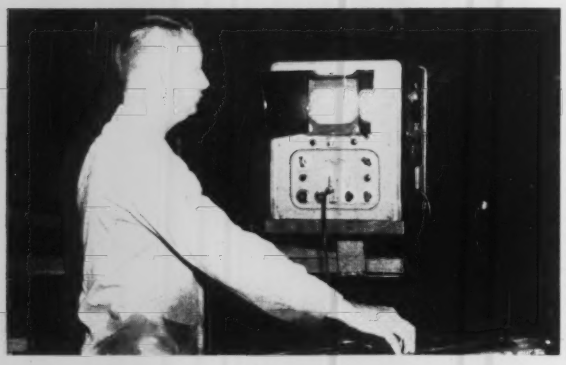
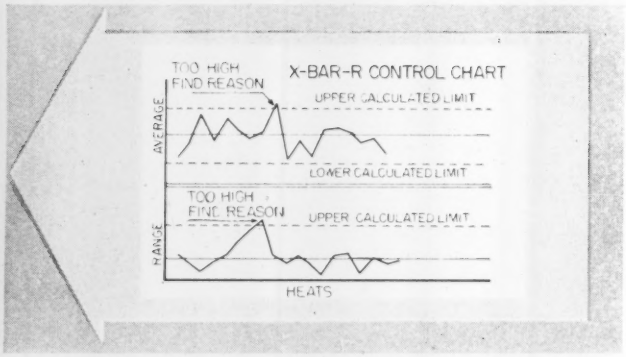
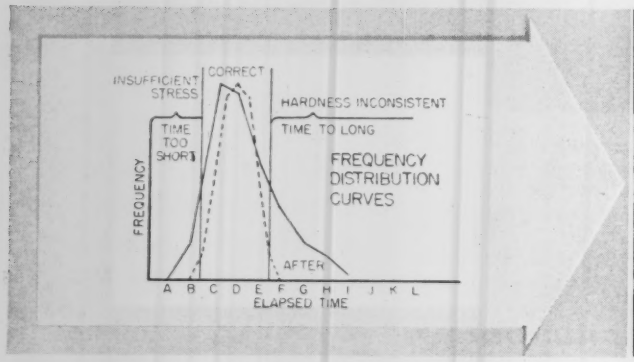
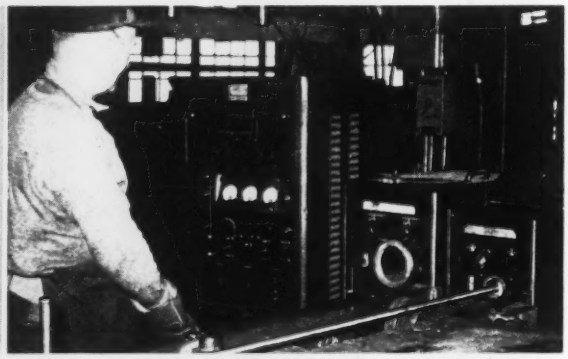




X—bar—R control chart shows when an operation goes beyond allowable limits. They are calculated separately for each job. Here the chart is used to record and control the depth of pipe in valve steel hot top billets





Frequency distribution chart shows how often related events (or conditions) occur. When plotted on a graph, they will normally fall in a "bell-shaped" curve. Too much eccentricity in the curve shows unbalanced conditions that may need correcting. Here the chart shows the frequency distribution of elapsed time between the rolling and straightening of valve steels and how this time variation affected magnetic inspection

Basic Guides to Steel Quality

A manufacturer can go to extremes to control quality in his products, but where he has his choice, three fundamental techniques will keep quality—and costs—in line

HERE'S a job-tested program that may give you ideas on how to tighten up your quality control operations. It's paying double dividends at Allegheny Ludlum Steel Corp., assuring quality in valve steels, and saving money by showing up weak points in manufacturing.

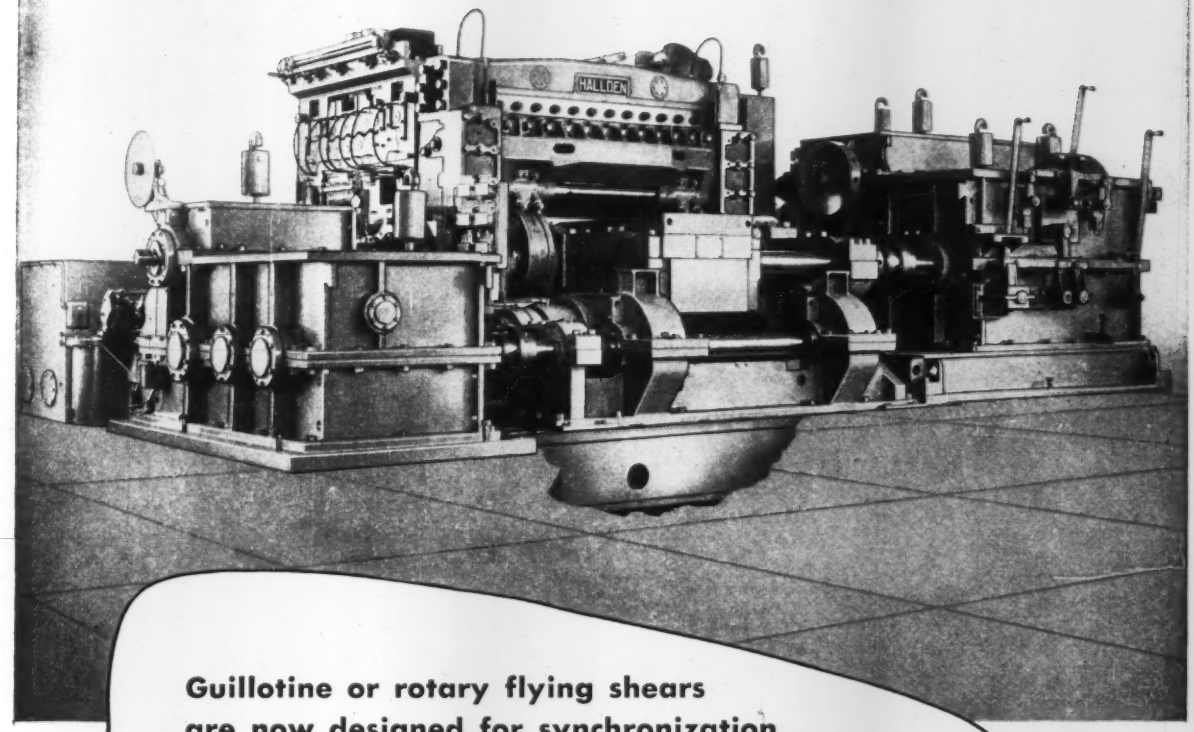
The program was described recently by T. P. Davis, quality control engineer at the Watervliet, N. Y., plant. It begins with people.

Important Trio — Management must support quality control by establishing an organization with the authority to get things done. At Watervliet the manager of quality is an assistant to the works manager, He directs the chemical analysis and metallurgical laboratories and the inspection department. The statistical quality control engineer is a member of his staff.

Backed by management, the quality control department can go to work with three elementary techniques: 1. Control charts. 2. Frequency distribution. 3. Sampling. Here's how they assure valve steel quality:

1. **Control Charts**—The semifinished product is a 2⅞ in. billet rolled from a hot top ingot. Some

SYNCHRONIZED *"On the Fly"*



Guillotine or rotary flying shears are now designed for synchronization adjustment without stopping the machine.

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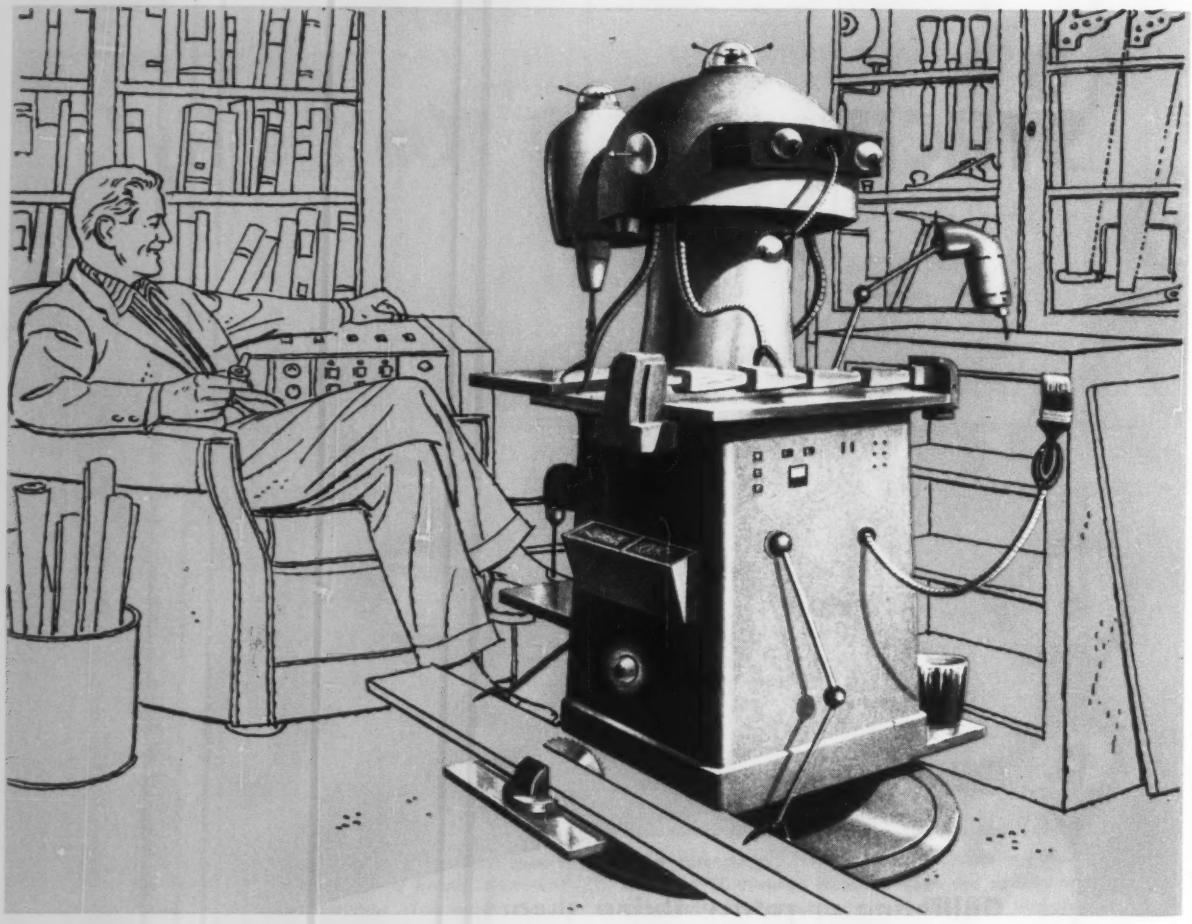

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An ALAN WOOD Representative can help!

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STEEL PRODUCTS
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A.W. Dynalloy (high strength steel)
Hot rolled sheets
Hot rolled strip
Cold rolled sheets
Cold rolled strip

ROLLED STEEL FLOOR PLATE
A.W. ALGRIP *abrasive*
A.W. SUPER-DIAMOND *pattern*

COAL CHEMICALS

A.W. CUT NAILS
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MINE PRODUCTS
Iron ore concentrates
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Sand

COKE
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PENCO METAL PRODUCTS DIVISION
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pipe will be left in the hot top end of the billet, and this section must be cut off and discarded before finish rolling.

The depth of the pipe is determined by standard ultrasonic testing. The test is assurance to the customer that no pipe is being rolled into the steel he buys, but it does nothing to increase the yield per ingot, or the uniformity of the product. That's a job for the X-bar-R control chart.

The chart shows the average length of pipe in the billets from each heat, also the range of length. When either gets beyond normal limits shown on the chart, it's a signal to find out why.

Maybe a heat was tapped too hot, or the hot tops weren't filled to the same level. Bringing such variables under tight control results in a more uniform product and increased yield per ingot.

2. **Frequency Distribution**—Many tons of finish rolled valve steels are inspected by magnetic analysis before being cut to length. The bar must have normal processing stresses, such as those which develop in heat treatment and straightening.

One valve steel gave inconsistent results with the magnetic analyzer. Some bundles had so little stress that the device could not be used; others were rejected for inconsistent or out-of-specification Brinells. Elapsed time between rolling and straightening seemed to be related to the problem.

When elapsed time was plotted as a simple frequency distribution for each bundle, the nature of the difficulty showed up plainly in the curve. If the elapsed time was too short, the bundles were not capable of inspection by magnetic analysis —if too long, the Brinells were out of the acceptable range.

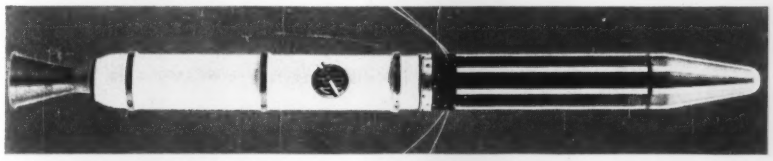
Now the foreman keeps a record of the elapsed time. If it is too short, he works on other bundles until the time for the first is long enough; if too long, he sends the bundle for additional operations that adjust the stress level. In this case a simple frequency distribution had a three-pronged effect: Improvement in the product, control of a process, and built-in assurance of quality for the customer.

3. **Sampling**—Most customers require 100 per cent macroetch inspection of aircraft valve steels—always a costly procedure. When the customer simply specifies steel "free of injurious internal defects," the mill has the opportunity to apply sampling, the third basic quality control technique.

In 100 per cent macroetch testing, a disc is cut from the end of each bar, polished, etched, and inspected for defects. In a sampling inspection, it's done on only a specified number of bars (depending on the size of order), and if the number of defects rises above a certain number, the whole lot is inspected.

The size of the sample and how it is chosen are determined from Dodge-Romig sampling tables. The company knows from experience that the sample will be representative of the lot. Here again, the customer benefits by a product of assured quality; the producer has a running check on his manufacturing efficiency; and costs are held in line.

• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, Ohio.*



OUR FIRST SATELLITE, THE EXPLORER, is proving out an idea that could help you solve problems involving protection of metal surfaces from high temperatures: A striped overcoat of aluminum oxide on its nose is safeguarding instruments in an environment that varies about 800° F every hour.

Norton Co., Worcester, Mass., which supplied the material, developed slender rods of aluminum oxide for a metallizing spray gun. With oxyacetylene fuel, the device melts the oxide at 5000° F. A stream of compressed air blows the molten material onto sandblasted metal.

The process is also used to protect the inside of rocket nozzles.

Pushes Krupp-Renn

American firm sees West as ideal location for this German iron ore reduction process

THE KRUPP-RENN process is ready to try again for American business. It will be marketed in this country by Southwestern Engineering Co., Los Angeles.

This hardy survivor of direct reduction's early years is well suited for the reduction of western ores with local coals, say Southwestern engineers: 1. It would utilize materials unsuitable for charging blast furnaces. 2. It would produce pellets (92 to 96 per cent iron) which would substitute for scrap in the open hearth or electric furnace.

Southwestern Engineering Co. estimates the minimum cost of pellets at $16 a ton.

World - Wide — Krupp - Renn plants have been built in many places where steel depends on iron from low grade ore and noncoking coal. Plants still operating are in West Germany, Spain, Greece, East Germany, Czechoslovakia, and Japan. The earliest one dates back to 1934.

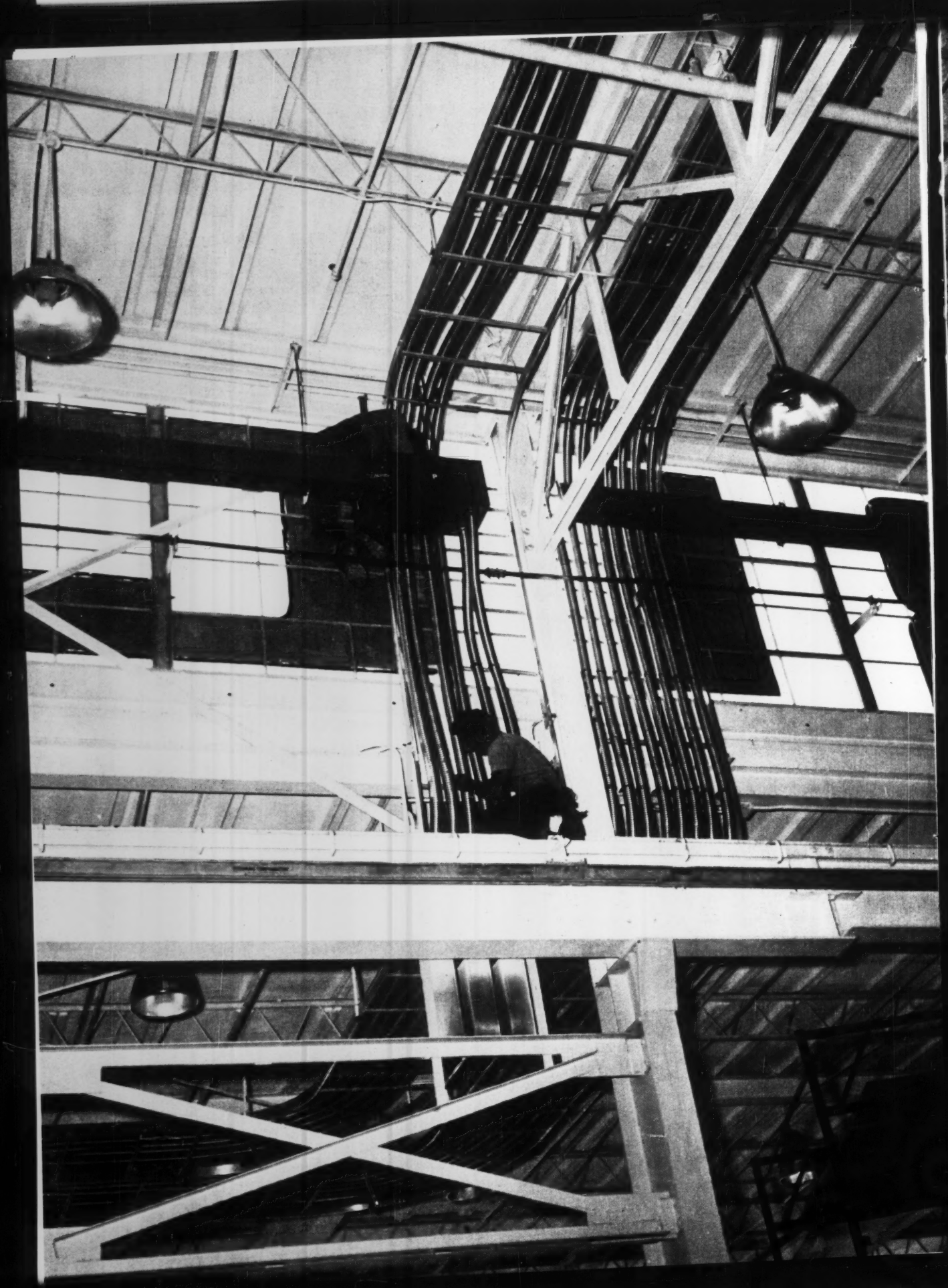
American steel companies are familiar with those operations. The Bureau of Mines has studied the process in detail.

Kiln Type — The Krupp-Renn (also called Johannsen) process uses a long kiln, like a cement kiln. It is charged with fine ore and carbon and is so arranged that reduction is mostly completed in the first two-thirds of the furnace. Final third is the nodulizing zone in which temperatures may reach 2800° F.

The lumpy product, called "Luppen," is a mixture of iron nodules and slag which must be separated by crushing and magnetic sorting.

Bugs—Krupp is reported to be making progress in closer temperature control of the process, greater refractory life, and the elimination of sticking and ring formation in the kiln.

The company estimates that a plant capable of treating 2500 tons of ore per day will cost about $15 million, or $6000 per ton of ore fed. It would be adaptable to ores high in silica, or those containing nickel, titanium, lead, or zinc, which can be recovered as byproducts.

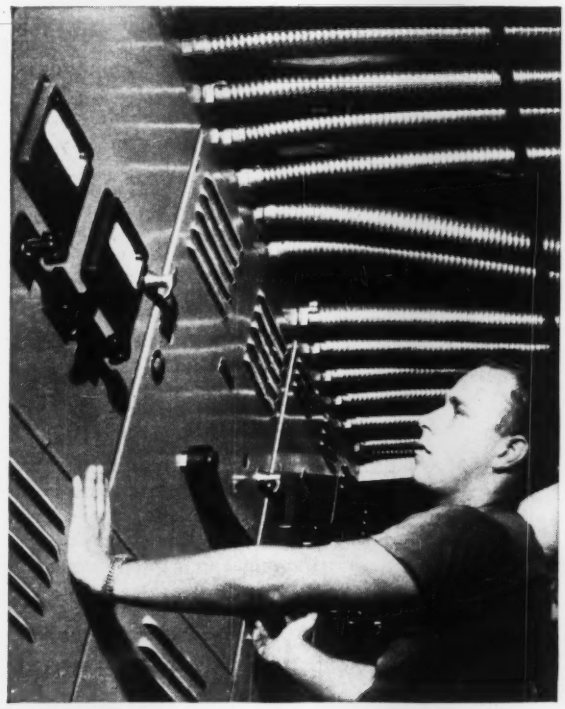


This picture shows why . . .

Anaconda's Duralox Cable cuts installation costs up to 50%

Duralox needs no conduit— saves time, money, manpower.

Duralox* is already enclosed in durable, yet flexible, metal armor. Thus, it can be installed *without* conduit—in long runs over and around obstructions, in trays, indoors or out.



THE FLEXIBILITY of Duralox Cable enables neat, efficient installation and facilitates equipment and terminal connections.

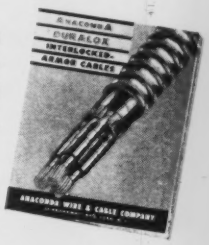
FITTING NEATLY AROUND BEAMS, Anaconda Duralox Cable installed in large industrial plant. Cable is 600 volt, 500 Mcm, varnished-cloth insulation.

Duralox is easily moved and is 100% salvageable — makes your entire plant operation more flexible.

And Duralox's lower reactance in higher voltages — because of the close spacing of conductors — results in reduced voltage drop and more efficient power distribution. Available in all popular sizes and voltages. Whether you're wiring a new plant or rewiring an old one—see the Man from Anaconda. Duralox is just one of the many types of Anaconda wire and cable that can help you increase plant flexibility . . . cut operating costs . . . get new power fast. Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.

*Reg. U. S. Pat. Off. 58307G.L.

BULLETIN DM5606 on Anaconda Duralox Cable is yours for the asking. Write: Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.



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for Industrial or Decorative Uses

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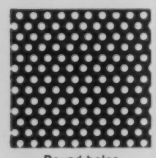
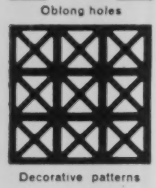


Round holes

Oblong holes

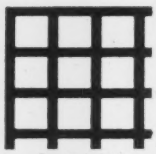


Decorative patterns

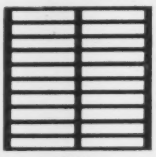
H & K facilities enable the perforating of all metals, wood, plastics and cloth fabrics. Perforated materials can be furnished in sheets, coils, rolls or plates. Fabricating services include shearing, rolling, welding and forming.

Perforated metal can be ordered with special finishes: aluminum—color anodized or brushed and lacquer finish; steel—painted, chrome plated, enameled, japanned or other baked-on finish. Decorative patterns can be embossed if requested.

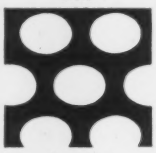
Many patterns in steel sheets (industrial or decorative) are in stock at our warehouses. Send for H & K Stock List Brochure.



Square holes



Slots



Oval holes

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FOUNDRY EQUIPMENT

A 8530-⅓

Doubling Bolt Life

Cold forging is the secret, claims this producer. Here's what his tests showed

COMPLETE cold forging of large diameter threaded fasteners doubles their fatigue life. Tensile strength is 12 per cent better, and related static physical properties are superior to those of bolts made by conventional production techniques.

Those are major findings of a test covering the static and dynamic properties of hex head bolts (1¼-in. in diameter by 5 in. long). They are made by Cleveland Cap Screw Co., Cleveland, on its huge Boltmaker (see STEEL, Sept. 16, 1957, p. 141).

Results — In dynamic fatigue tests, the bolts lasted 60,000 cycles —nearly double the life of unforged specimens. In tensile tests, they showed ultimate strength of 92,900 psi.

Why?—Engineers at SPS Laboratories, research wing of Cleveland's parent company, Standard Pressed Steel Co., Jenkintown, Pa., cite several reasons for the good showing. Cold heading, they say, produces a uniform washer face and fillet radius under the head of the fastener. The thread rolling provides beneficial cold working in a critical area.

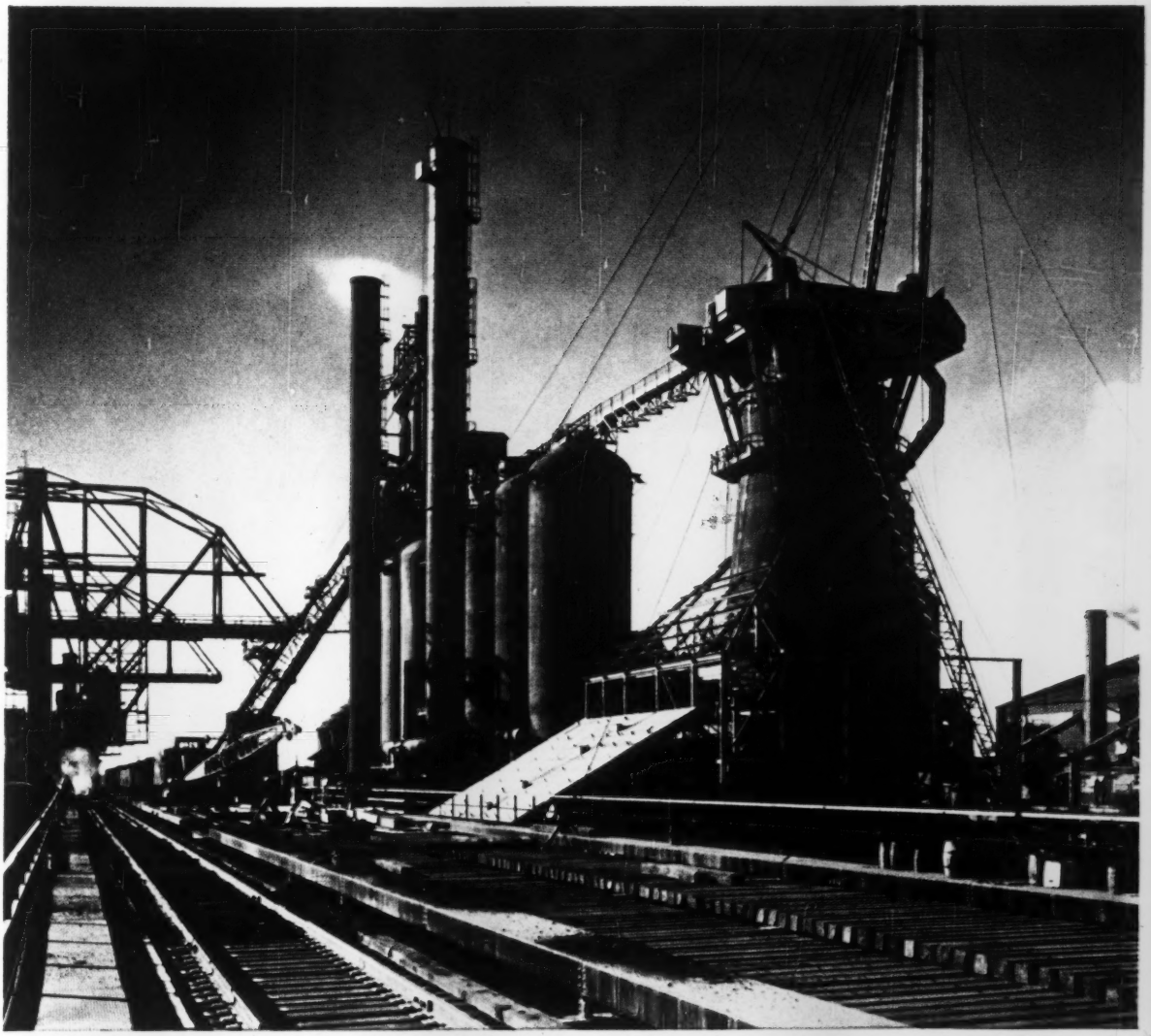
Cold forging of both the head and threads also retains the strength-giving grain flow of the fastener material.

The Machine—Costing $500,000, it is the largest of its kind, the Cleveland firm believes.

Built by National Machinery Co., Tiffin, Ohio, the machine uses the Kaufman double extrusion process. Raw material is wire or rod. A series of forging operations reduces the metal to a pitch diameter ready for rolling.

Ultrasonic Deburring

STEEL's Apr. 7 issue featured an article on "Deburring with Ultrasound," Page 102. The company doing the work is Research Associates, Alhambra, Calif. We erroneously reported it was done by Research Associates Labs Inc., Los Angeles.



Under construction—Trenton, Michigan, Plant

McLouth Blast Furnace No. 2

The second major expansion in four years is nearing completion at McLouth Steel.

We are again adding to our facilities to bring you better steels for the product you make today . . . and the product you plan for tomorrow.

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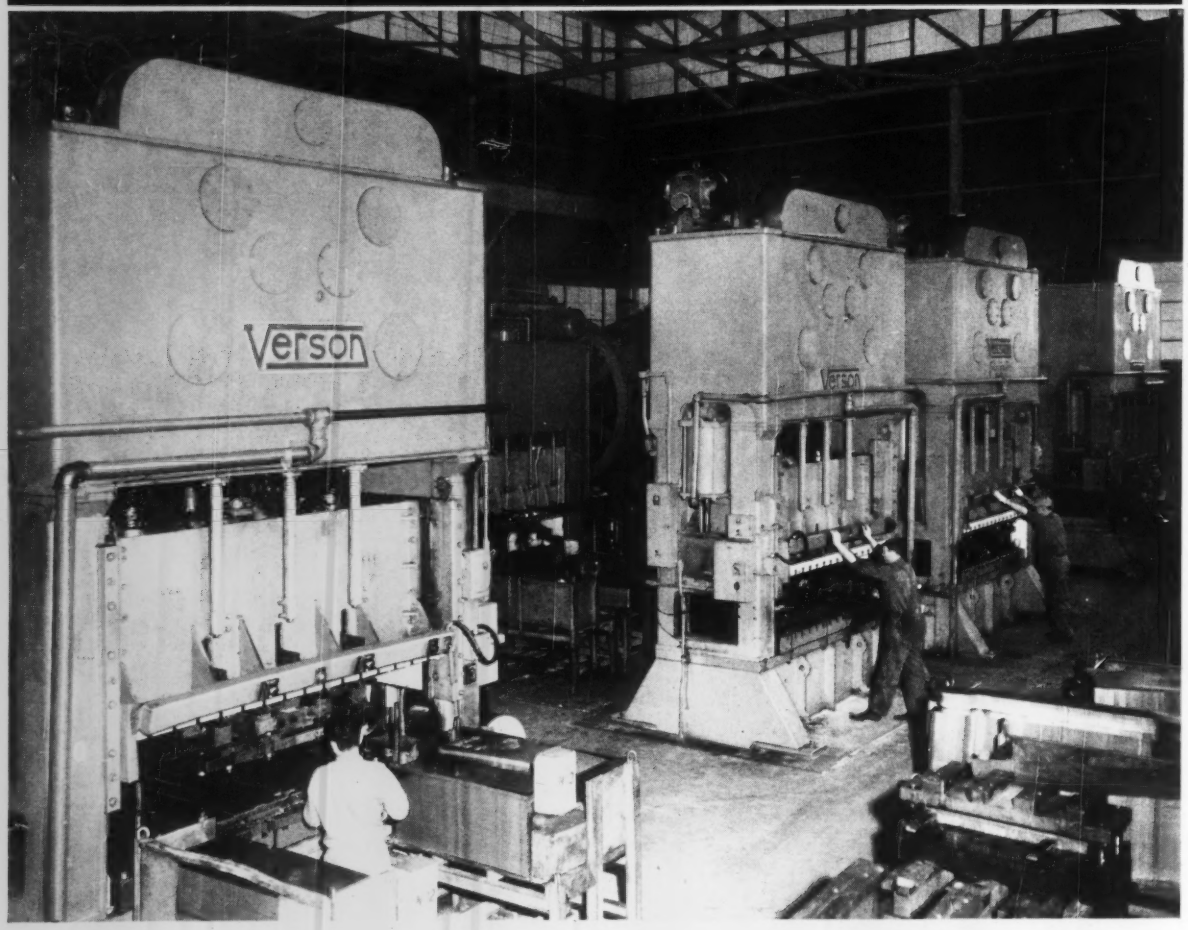
Manufacturers of high quality stainless and carbon steels.

To make manufacturing more efficient . . . more profitable . . .



Another versatile production process engineered and developed by Verson

To achieve a more efficient, more flexible metal-working plant, Lobdell-Emery Mfg. Co., Alma, Michigan, recently installed these four Verson 250 ton eccentric presses.

Used as individual units, the machines are employed for blanking, drawing and forming operations on a variety of parts. In operation as a production process, the four units are utilized for the fabrication of station wagon panels. Primary production is on seat backs and cushions and floor panels for a major automotive manufacturer.

The four machines are identical. Each has a capacity of 250 tons with slide and bolster area measuring 48" x 96". Operating speed is 25 SPM.

If versatility of operation is one of your aims . . . and more profitable production essential, look into the Verson concept . . . "Anyone can build a press . . . Verson builds production processes."

182

A Verson Press for every job from 60 tons up.

Verson

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New, Hard Nickel

Deposited on a plastic sheet, it is flexible and has high resistance to impact and abrasion

A NEW material, called Micrograin nickel, is extremely hard (600 Brinell) but still flexible when it is deposited on a plastic sheet.

The developers of the process, Metachemical Processes Ltd., England, say the material resists abrasion and impact better than stainless steel or nickel deposited from solutions containing organic agents.

First Use—Micrograin is being used on the leading edges of aircraft propellers to guard the deicer elements against hail and stones during landing and take-off. The nickel is deposited on a plastic sheet shaped to the edge of the propeller, then cemented in place with an epoxy adhesive.

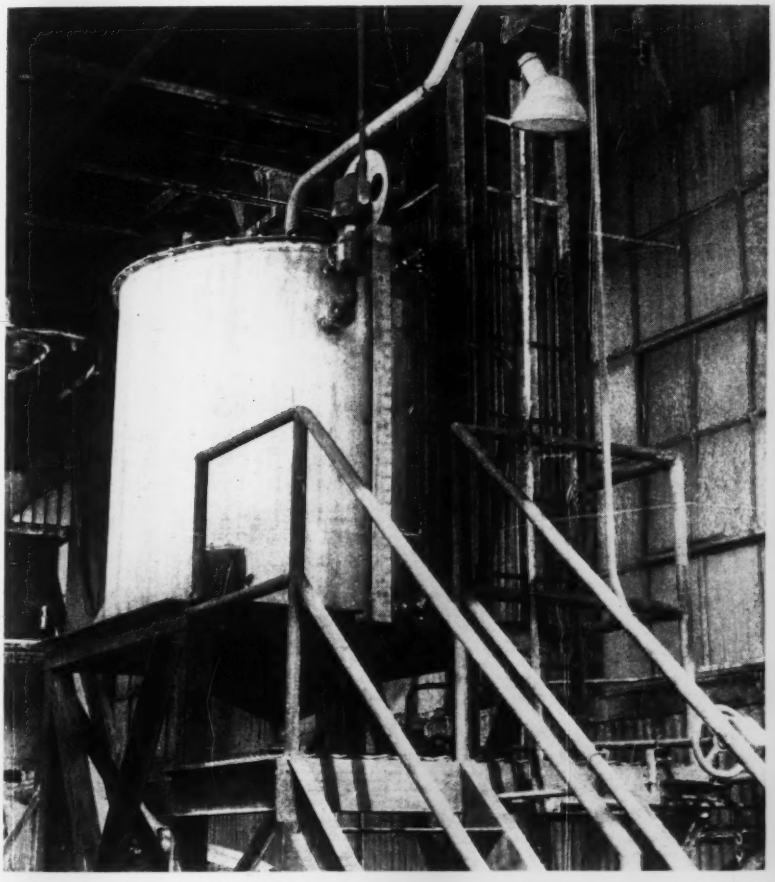
Possible applications: Boat propellers could be protected against cavitational erosion. Kitchen counter tops and splash boards could be covered with thin layers of Micrograin. Kneeholes in desks, always a point of wear, could be protected against bumps from chairs by narrow strips of the material.

Auto bumpers some day may be left rough, and finished with a carefully shaped electroform before chrome plating, instead of grinding, polishing, and sealing. Metachemical Processes reports that one European carmaker is doing that experimentally.

Why It's Different—The company says the superior properties of the nickel electroform stem from the fine grain deposited electrolytically. A standard nickel sulfate bath at conventional pH and temperature is used, but without organic addition agents.

The fine grain is said to be due to the characteristics of the electrically conductive plastic sheet on which the nickel is deposited.

How It's Made—To make a nickel electroform, a master mandrel of metal is cast to the contours of the surface to be protected. A plastic coating, several mils thick, is applied. After a flash coat of copper has been deposited, the unit is immersed in the nickel plating solution and left until the required thickness has built up.



A magnetic control unit automatically prevents overflow of nitric acid when filling this tank. The acid is used in pickling operations

Makes Acid Handling Safe

Automatic liquid level control prevents overflow of nitric acid by stepping in when the operator isn't doing his job properly. Its maintenance requirements are low

AN automatic liquid level control insures the safe handling of nitric acid for the pickling operation at International Nickel Co., Huntington, W. Va.

The device prevents overflow during the filling of measuring tanks. Normally, an operator manually controls the flow of acid from storage tanks by watching a prismatic gage glass.

The control shuts off the flow if the level gets too high because he is not watching or his vision is obscured.

Reliable control is complicated by high moisture content and acid vapor in the air. The plant found the problem was solved by a control made by Magnetrol Inc., Chicago.

International Nickel says the control has required no maintenance in four years of operation.

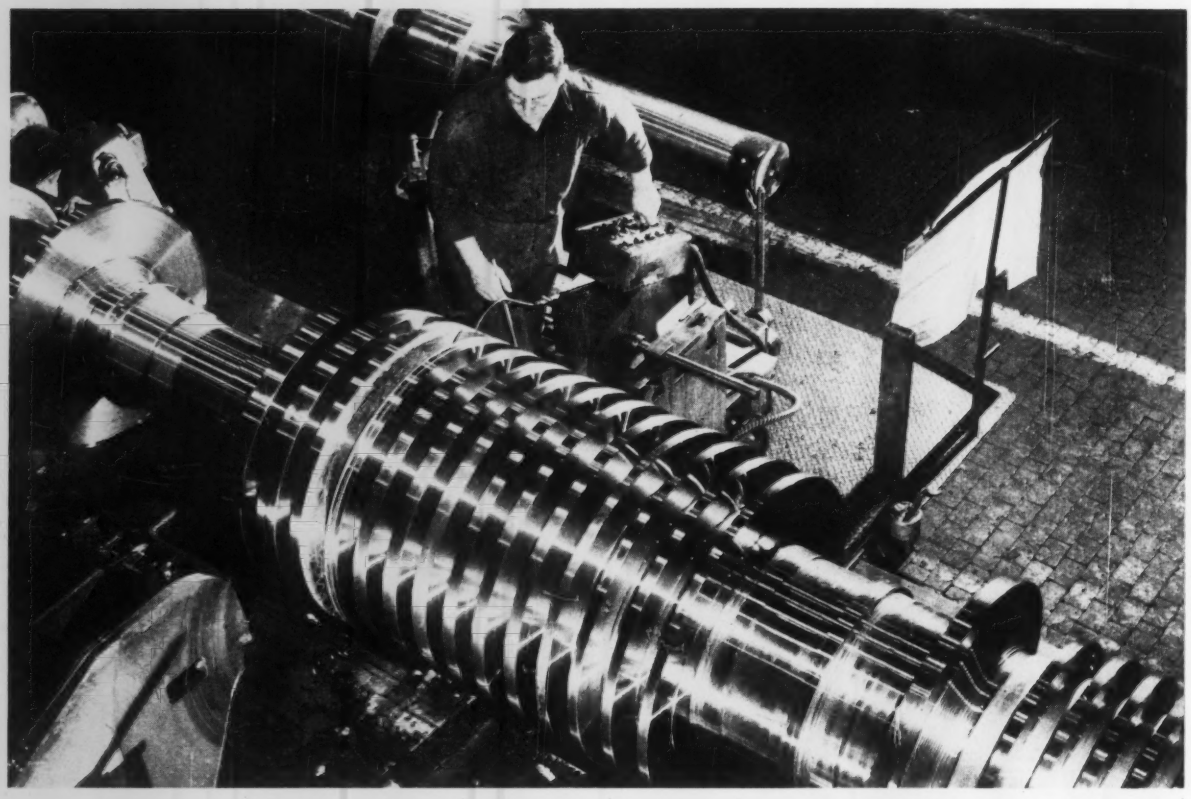


Fig. 1. Deep grooving lathe—nine basic problems were considered

How We Buy Machine Tools

By W. W. KUYPER

Large Steam Turbine-Generator Dept.
General Electric Co., Schenectady, N. Y.

The success you have in getting the right machine for the job depends on the procedures you use to determine your needs and make the proposals. Here are eight key rules

YOU CAN easily spend 5 per cent of the budget for a proposed equipment expenditure on manhours needed to analyze the proposal.

How you make out depends a great deal on what you do before judgment is passed on the final proposal by bankers, directors, and appropriation committees.

Somewhere within the organization you need men to conceive proposals, separate the sound from the unsound, and champion those they deem vital to the company's welfare.

The Base—Our department employs about 7500. Output follows the growth of U. S. power consumption, necessitating the doubling of our manufacturing capacity every eight or ten years.

Our manufacture is characterized by large parts, relatively close tolerances, small quantities, and gradual but continuing technological change. It is not job shop production but a sort of patterned low volume production.

Here are eight guideposts that help us select new equipment projects worth study.

No. 1: Assign Responsibility

If planning for new equipment is done by the operating superintendent, he can too easily rationalize his failures. He doesn't suffer the discipline of failure. He can cover his mistakes because he is his own customer.

If the work is divided and comes together only at the level of the top executive, you may have too much bickering.

Whenever you can justify it, assign the whole job to a separate unit. Make it responsible for analysis of need, procurement of equipment, initial operation, and the setting of work standards.

The wisdom of such an approach is brought home when you consider the many facets of a typical project.

Example—Take the special deep grooving lathe shown in Fig. 1. The workpiece is received as a rough turned forging. The basic operations are: Semifinish turning, deep

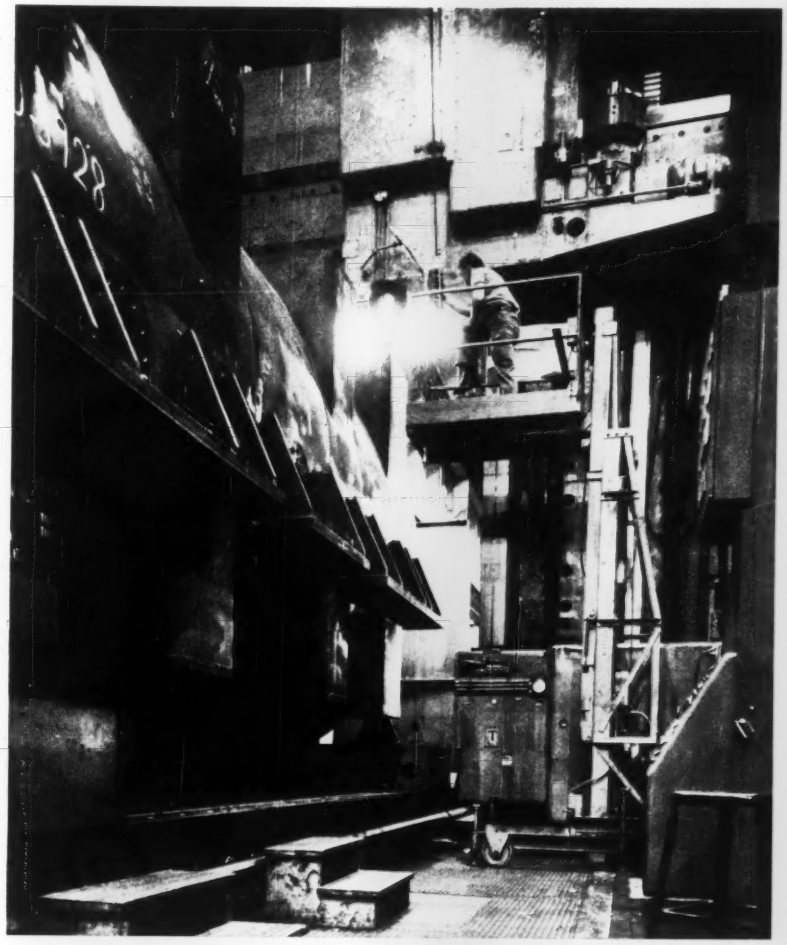


Fig. 2. Adjustable rail milling machine—it beat performance guarantees

grooving, finish the bottoms of the grooves, and heat treat in another special lathe. A thorough study must be made and many questions answered, such as:

1. Can the first of these operations be done profitably in the grooving lathe? Can the third?
2. If so, how can we quickly remove the special toolholders and install a standard or special compound? What are the economics?
3. Should we provide some means of indicating carriage and tool position? Can we afford the luxury of a digital indication?
4. Should we provide for presetting the carriage position during the preceding cut?
5. How much pendant pushbutton control is necessary for ease in setting the back tool?
6. What kind of chip conveyors should be used?
7. How should we make the radiuses at the bottoms of the grooves?
8. How much power should we provide at what speeds?
9. Should we apply tracing?

In addition, we must predict the time needed to make typical workpieces.

When the machine is received, it must be installed, its performance proved, operators trained, and time standards established.

Final responsibility should be given to one man. He must inte-

(*Please turn to Page* 120)

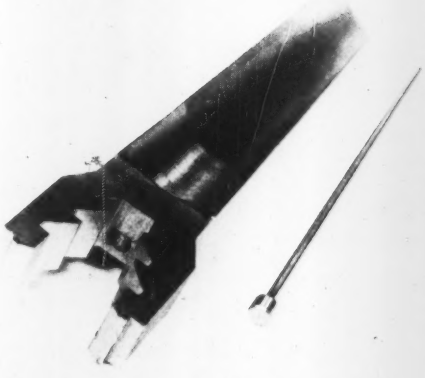


Fig. 3. Turbine bucket—integrated equipment package does five jobs on it

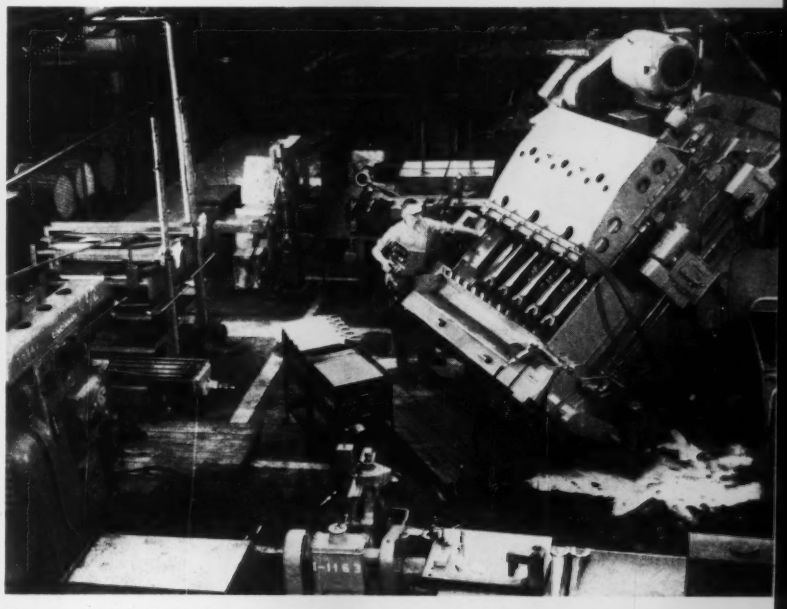
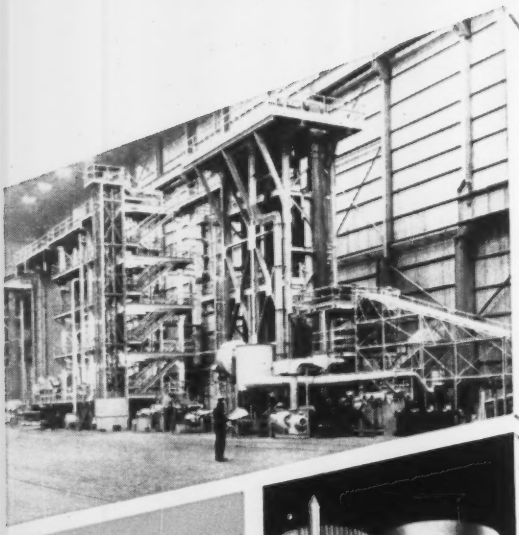
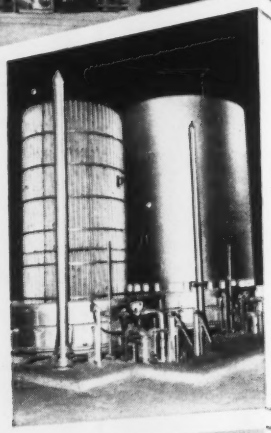


Fig. 4. Hydraulic bucket contouring machine—it's built for future shapes

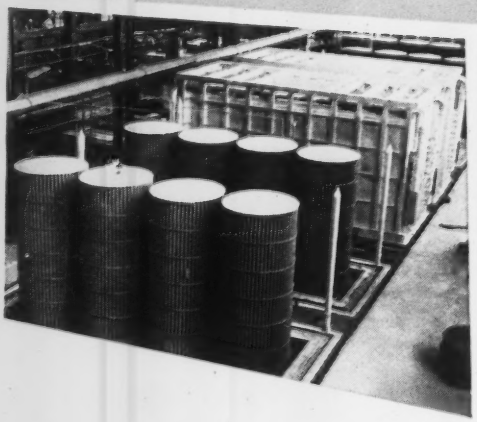


VERTICAL STRIP ANNEALER



SINGLE-STAND ANNEALERS

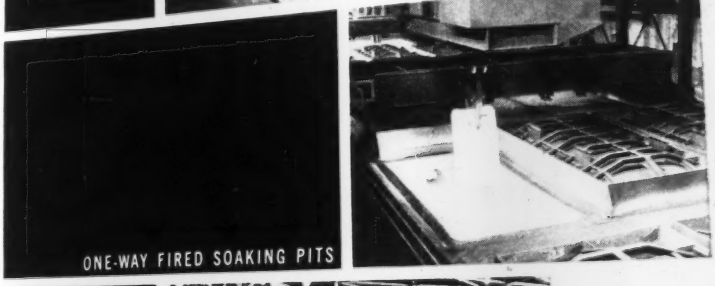
CONTINUOUS STRIP GALVANIZER



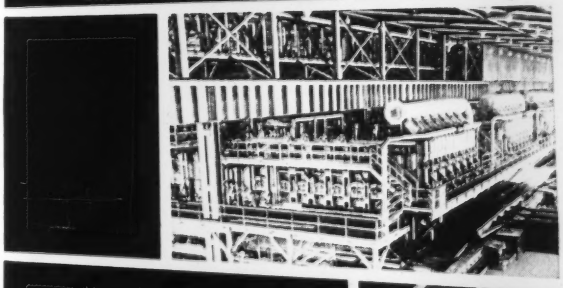
MULTIPLE-STAND ANNEALERS

foundation for steel mill profits

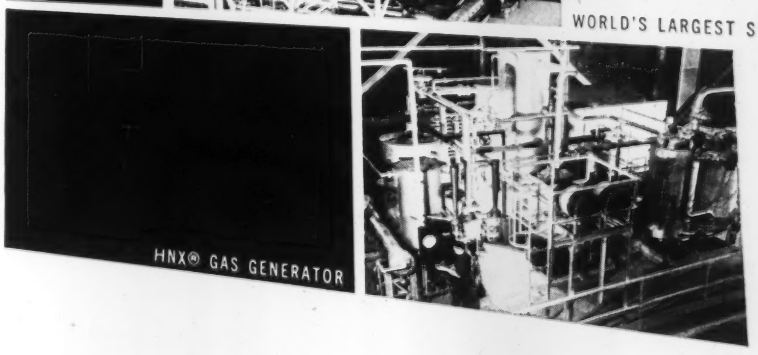
CARBOTTOM COVER FURNACE



ONE-WAY FIRED SOAKING PITS



WORLD'S LARGEST SLAB HEATER



HNX® GAS GENERATOR

You put a solid foundation under your profits whenever you specify Surface equipment. Whatever type it may be, you know it is supported by many interlocked blocks of know-how in heating and handling steel.

The technical skills which Surface has developed in building soaking pits will benefit the man who buys Surface annealing covers. In the same way, Surface concepts of slab heating contribute to high-speed stress relieving . . . carbon restoration to strip annealing . . . controlled atmospheres to wire patenting.

Because of this broad and deep foundation of experience, Surface can improve any single process in the context of a complete sequence of operations. This is to the customer's profit, as many companies will confirm.

Surface

wherever heat is used in industry

ASSOCIATED COMPANIES: British Furnaces, Ltd., Chesterfield • Stein & Atkinson, Ltd., London • Stein & Roubaix, Paris • S.A. Belge Stein & Roubaix, Bressoux, Liege • S.A. Forni Stein, Genoa • Chugai Ro Kogyo Kaisha, Ltd., Osaka • Benno Schilde Maschinenbau, A.G., Bad Hersfeld

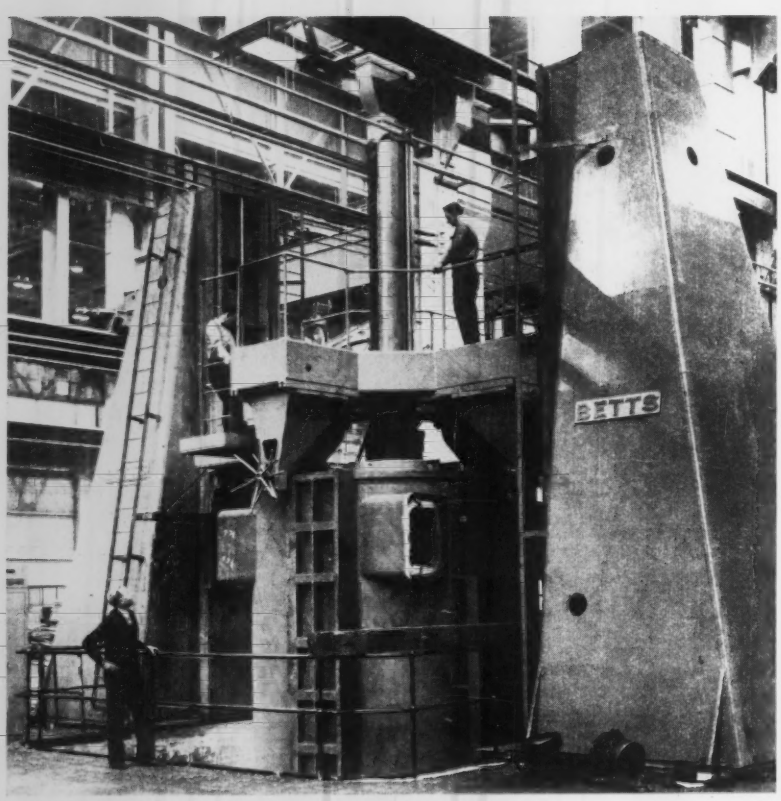


Fig. 5. Vertical bar boring machine—a special with a sure payoff

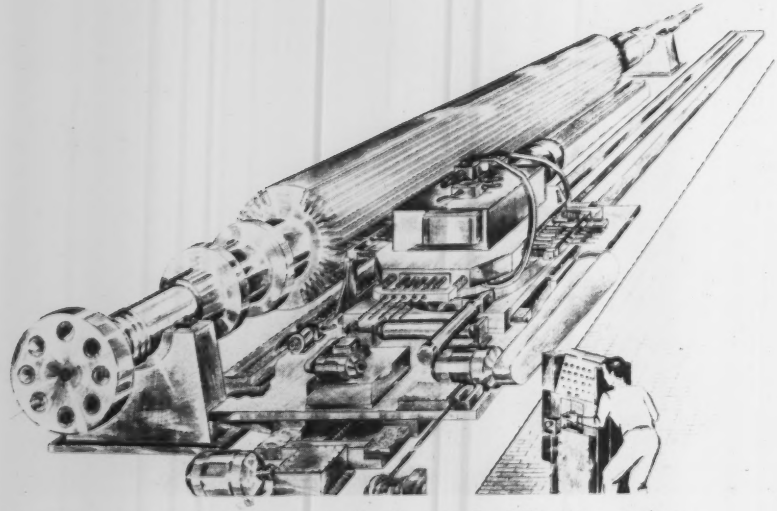


Fig. 6. Tape controlled drill and mill—here is flexibility in a package

MACHINE TOOLS . . .

grate all details if the project is to be completely successful.

No. 2: Performance, Not Reputation

It's easy to buy a No. 5 milling machine or an 8-ft vertical boring mill. It is more difficult to buy a machine to do a given job and to determine that that job is fully representative of all work the machine will be asked to do.

Yet the only safe way to buy a machine is to determine performance requirements on specific work. Too often we find too late that XYZ Co.'s cabbage cutter earned its reputation on designs that were outstanding 10 or 20 years ago and that someone else has the best product to offer today.

The large adjustable rail milling machine (Fig. 2) was bought with guarantees that it would machine certain typical pieces in a specified time. It surpassed the guarantee.

Actually, the guarantee by itself is not always of primary importance. When the machine is received, the need for it may be so great that less-than-expected performance will be accepted. One real value in a guarantee lies in its definition of responsibility.

With standard machine tools, it is practical and desirable to machine typical workpieces and prove performance before placing an order. With special machines, the vender's integrity and guarantee and the accuracy of the purchaser's analysis provide the necessary assurance.

No. 3: The Whole Package

A machine tool often does only one operation on a part, sometimes two or three. The machine must have an operator.

But many other factors must be included in the study—the previous operation, the following operation, tools or cutters, cutter sharpening, production control routines, and material handling to, at, and from the machine.

Automatic operation influences equipment choice in unexpected ways. It can be used to make a bigger proposed package. It should not be used to make a watcher out of the operator.

Example—One such package resulted from the problem of drilling a 0.2-in. hole, 10 in. deep in the turbine bucket shown in Fig. 3.

As shown, the pin fits in the hole. The deep hole drilling is complicated only by requirements of straightness and bottom contour. But deep hole drilling machines are automatic; the operator watches, he doesn't operate. There isn't enough work to be done to let him operate more than one machine. With the help of a little equipment, he can sharpen his own drills, but he is still not busy.

By including a machine which

THEY *get to take a last look inside*

Standard Oil research develops method for inspecting lubrication of enclosed parts without disassembling

What if you had to make a final inspection of enclosed parts to be sure they were lubricated and you could not do it without disassembling? Standard Oil research scientists have just developed an instrument system that determines lubricant level in an instant. The device measures the density of an assembly so precisely the presence or absence of the desired quantity of lubricant registers on a meter.

Having such a unit might permit you to shorten an assembly line or reorganize assembly operations for greater convenience, speed, economy. The research men at Standard who developed this inspection method will be glad to share their know-how with you to help you fit it to your assembly operations.

This is the research pay-out you get from Standard. This is the "something more" Standard gives to industry besides the research which has established Standard Oil petroleum products as the industry criteria for quality.

For more information about this development or for assistance on other lubrication problems, inquire of any of the 48 Standard Oil district offices in the 15 Midwest and Rocky Mountain states. Or write **Standard Oil Company (Indiana), 910 South Michigan Avenue, Chicago 80, Illinois.**

You expect more from **STANDARD** *and get it!*

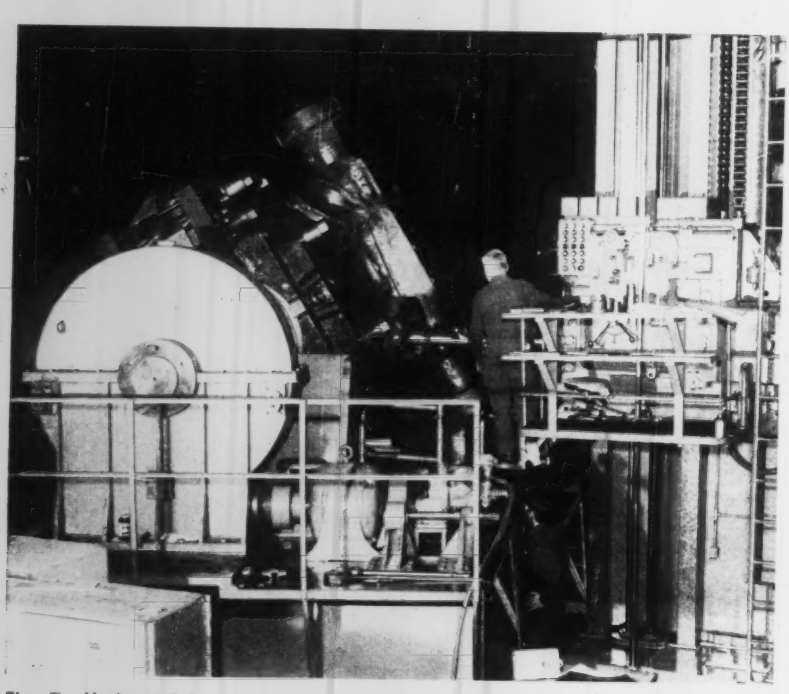


Fig. 7. Horizontal boring mill—it's the best, but not the most obvious, solution

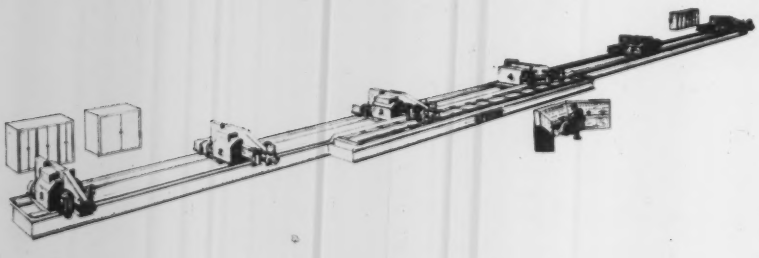


Fig. 8. Inverted transfer machine—the heads move to the work

automatically grinds pins to proper size, the work package becomes: Drilling the blade, sharpening the drill, grinding the pin to size, assembling the two parts, and testing. The operator is reasonably busy.

The grooving lathe already mentioned is fitted only for deep grooving of the workpiece. Two subsequent machines, now being installed, can be changed quickly to do the first operation (turning the body) and the third (contouring the bottoms of the grooves) at maximum efficiency. Doing all three operations on one machine precludes idle workpieces before each of the last two operations.

No. 4: Tomorrow, Not Today

In the electric utility industry, it is practical to project the dollar value of business with confidence. More difficulties arise in projecting the design detail to which future machine tools must be fitted.

Yet it is vital that some attempt be made to forecast what design should be, if only for a few years ahead. Any shop is, in effect, a strait jacket on the designers. The designer tends to design within the limits of the shop. Machine tools last a long time. It takes time to put them in place. It is too easy to buy tools that are partially obsolete the day they are received; that limits the ability of the business to produce. We must buy the tools that will still look good in five years.

Fig. 4 shows a hydraulic tracing machine with six spindles for finish contouring turbine buckets. Other machines of more limited applicability could be applied at lower cost; but this machine can produce shapes not needed now that may be advantageous in the future.

No. 5: The Unconventional

The committee approach can be justified only if conventional tools can be applied in an especially effective way, or if special machines can be bought which are strikingly profitable.

The builders of standard machine tools will continue in business no matter how hard we try to buy specials. Most of our equipment always will be conventional. But to the extent that we can apply effective special machines, we give ourselves a chance to be different from, and better than, our competitors.

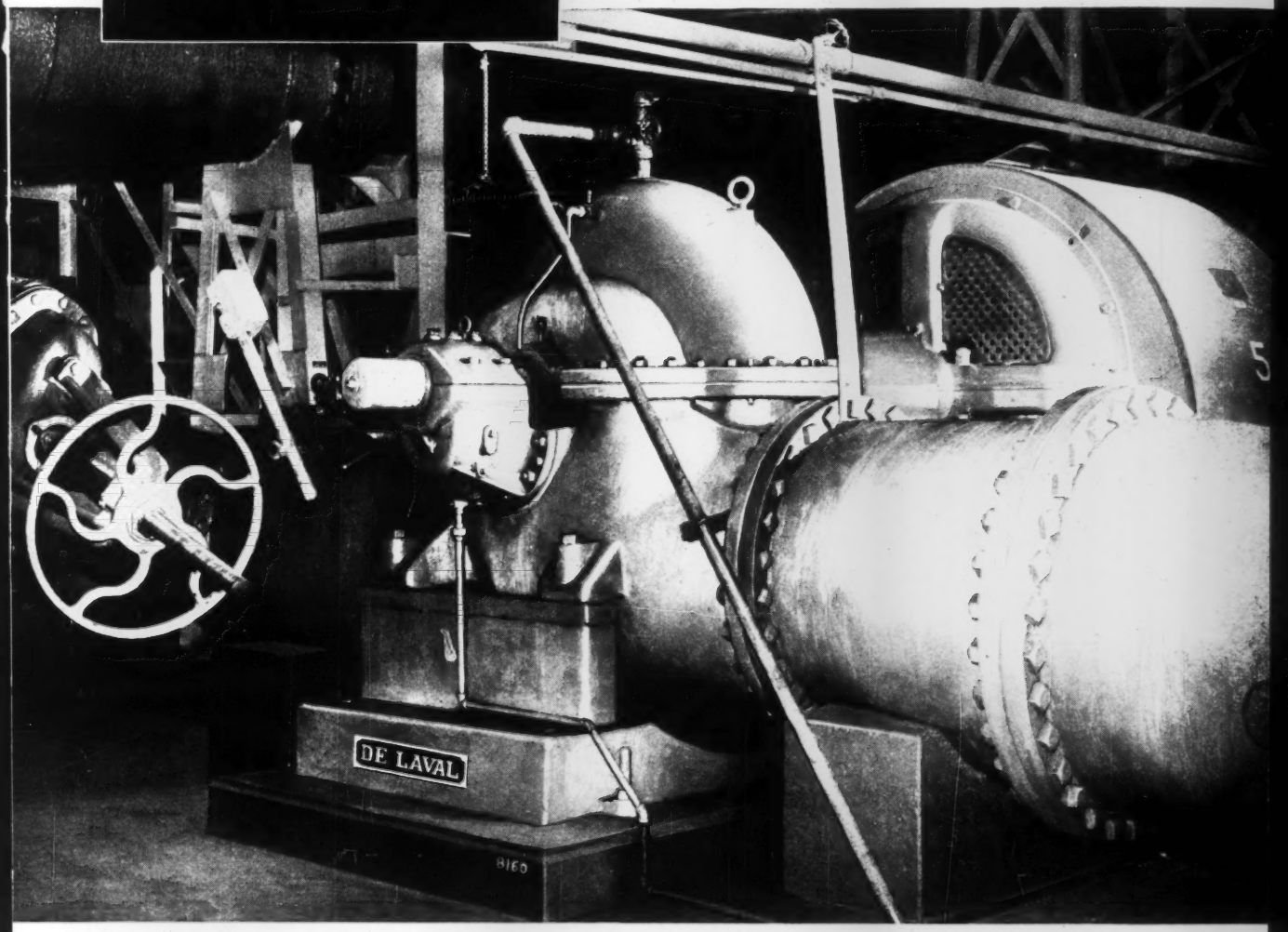
The man who tried to continue using only engine lathes when turret lathes were invented soon found himself at a serious disadvantage. The same thing was true when automatics replaced turret lathes in some applications. In our plant, one of the strikingly effective special tools is the vertical-bar boring machine in Fig. 5. Conceived about ten years ago, it has saved a great deal of time, money, and floor space, compared with conventional horizontal boring machines. It has been far more effective than any of the conventional tools purchased at about the same time.

A machine which promises to be equally successful (Fig. 6) is now in its first production operation. It's a large drilling, reaming, and milling machine. The multiple spindle, turret type unit is tape controlled. It produces holes with different patterns, entrance shapes, and contours in large generator rotors. It will be busy about two shifts and do the work of several radial drills and horizontal boring mills. Compared with standard machines of the same capacity, it will take up much less floor space, have a shorter cycle time, and take a lower investment and operating fund.

(*Please turn to Page* 124)

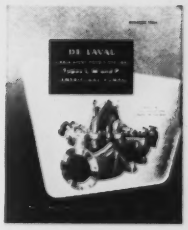
DE LAVAL
CENTRIFUGAL PUMPS

in service since 1911 at Inland Steel Co.



De Laval Centrifugal Pumps have a record of dependability at the Inland Steel Co., which goes back forty-five years. In that time, De Laval has supplied this major producer with pumps for practically every steel mill service—*more than 75 units in all.* The photograph shows one of the largest De Laval pumps on the line at the East Chicago, Indiana plant of Inland Steel. The unit delivers 20,000 gpm at 120 ft head.

De Laval Centrifugal Pumps are available for a wide range of applications in all types of metal-working plants. Types L, M and P single stage double suction pumps can handle capacities from 1,000 to 20,000 gpm and heads to 350 feet. Larger De Laval units of any capacity to meet any requirement for steel mill service are available.



Send for Bulletin 1004 giving performance and application data.

DE LAVAL *Centrifugal Pumps*

DE LAVAL STEAM TURBINE COMPANY
860 Nottingham Way, Trenton 2, New Jersey

BL366

No. 6: Where It Counts Most

Suppose we have ten small turret lathes, and we need more capacity. The obvious solution is to buy another one. It may not be the right answer.

Somewhere in this miscellany of parts made in the turret lathes there may be (and probably is) enough work and high volume to justify a multiple spindle automatic or two. The correct answer is usually not obvious. It is often several layers deep in the analysis.

Example—An application of this principle (Fig. 7) is a floor-type horizontal boring mill that makes a series of 30-in. deep bores at compound angles in a steam turbine shell. Inside the workpiece is another shell which must be line bored with the outer shell.

With previous equipment, we had to spot the inner shell while machining the outer. Then we set up the inner shell separately to machine holes previously spotted.

Additional horizontal boring mill capacity was needed to meet the growth of the manufacturing schedules. By getting a machine ideally suited for making deep bores in restricted areas, and suited for carbide tooling under these conditions, it was possible to improve a number of limiting operations. By tailoring the new machine to the work to be performed, we got maximum effectiveness of over-all capacity.

The only real limitation on the possible number of combinations to be considered is the ingenuity of the men making the analyses.

No. 7: Consider the Transfer

One of the greatest problems of a low production shop is the necessity for keeping track of large numbers of different items, each with different production sequences.

The most effective tool or concept which has been developing in high production is the transfer machine. It forces the concept of flow into the minds of all men studying the operation. Unfortunately, we tend to think that the transfer machine is adaptable only to high production.

Actually, the transfer principle can be applied, in a small way, even in low production. We apply it whenever we increase the number of operations at any one work station. Perhaps we can say that the transfer machine is the variant of the basic idea of doing more work at one work station.

Example—We can have an inverted transfer machine. The simplest form is a turret lathe in which various tools in succession are brought to bear upon the work. A more complex machine is shown in Fig. 8. This machine is being set up for production. In it, each of six heads is brought to bear (in succession) on a ribbed copper extrusion about 30 ft long. Typical operations are: Assemble and weld small copper slugs or filler pieces in place, machine the sides, machine rib sections, cut off at specified angles, taper the ends, and deburr.

The entire operation is card controlled. This permits handling a wide variety of similar workpieces (only two pieces out of a hundred are alike). Doing substantially all the operations in one machine, with the individual units of the machine moving in sequence over the work effects surprisingly large savings in floor space and manpower.

On the six-spindle machine (Fig. 4) the operator does the transferring. He centers workpieces on a special machine behind him, cuts the bucket section on the six-spindle machine, saws off a false tenon on the milling machine at lower left. In addition, he sharpens his cutters on the special grinder behind him. The operator is occupied during the 2-hour cycle. The workpieces don't wait between operations. A fully automatic machine is used to good advantage here in low production.

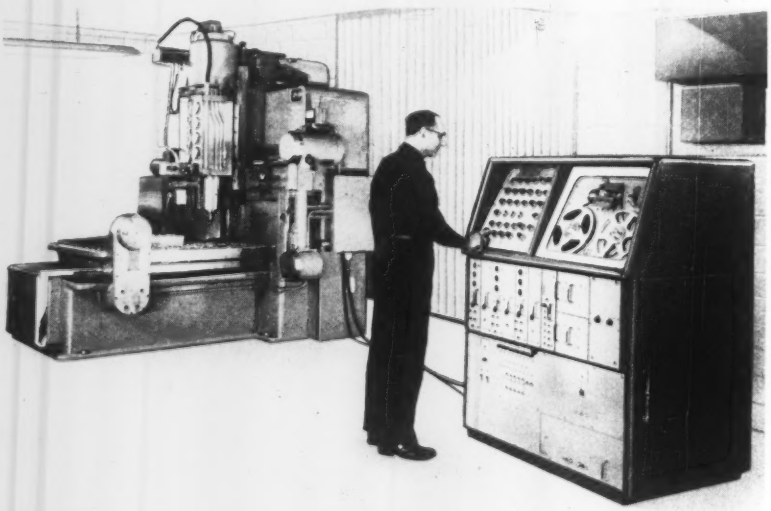
No. 8: Be Discontented

It is easy to become emotionally attached to machines. We assume they are wonderful, that nothing can equal them—especially when we were present at their conception.

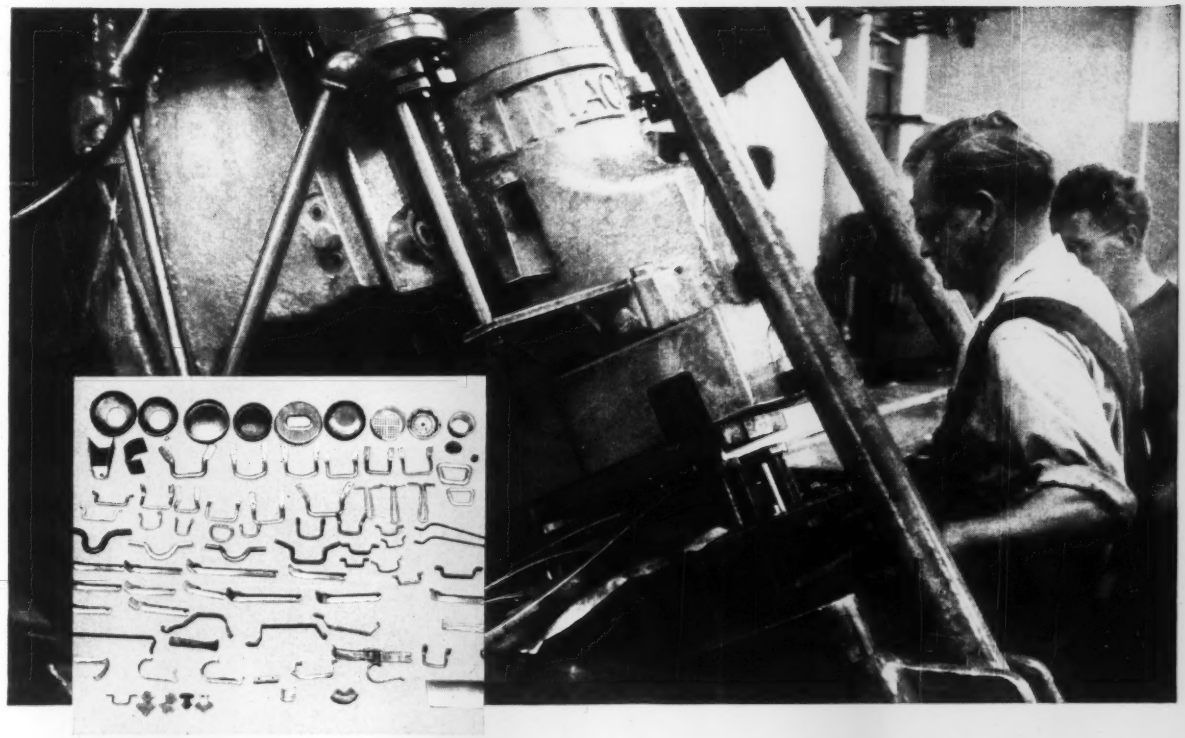
But each job can be done better—each tool can be improved. Usually, the older the tools and the methods, the more easily they can be surpassed. Each concept of a new tool will look imperfect when judged by standards five years hence.

Unless we are deeply discontented with what we can do, we will buy equipment we could have used five years ago. Our success is measured by our ability to buy equipment today that others buy five years from now.

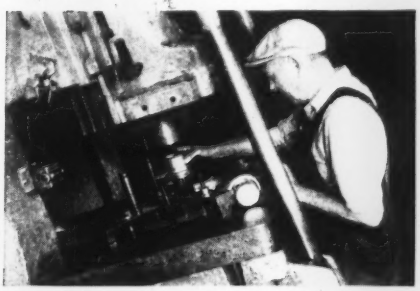
Oscar Wilde said: "Discontent is the first step in the progress of a man or a nation." That applies to a factory, too.



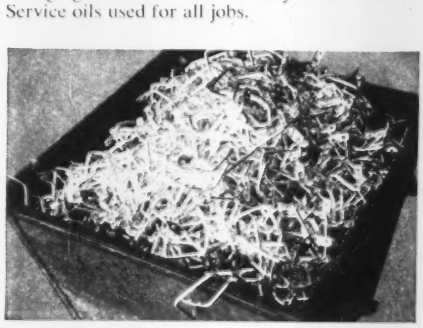
SMALL PLANTS with job shop requirements are the targets of this line of numerically controlled milling machines. Selling for less than $100,000, the machine has automatic control of all operations, including the cutting of true circles with tolerances to 0.001 in. The machine, built by Morey Machinery Co., New York, has a 30-hp spindle with speeds of 20 to 3600 rpm. The magnetic tape control unit is the Digimatic, built by Electronic Control Systems Inc., Los Angeles, affiliate of Stromberg-Carlson Div., General Dynamics Corp.



"We stamp them all using just 2 Cities Service Oils!"



Presses shift to numerous operations without ever changing oil, thanks to versatility of the 2 Cities Service oils used for all jobs.



Handles by the thousands are produced by Res for cooking utensils and similar items. Finish is excellent, thanks to Cities Service oil.

...says Res Manufacturing Company Milwaukee, Wisconsin

It's doubtful if anyone makes a more diversified line of stamped and formed metal products than Res Manufacturing Company.

With its 21 presses, ranging from 15 to 200 tons capacity, Res turns out millions of articles a year . . . wire handles, metal handles, wire forms, drawn shells, lifting loops, and parts for electrical controls, to mention just a few.

"All require the best possible finish and all get it with the use of just two Cities Service oils," says Assistant Plant Manager Herbert W. Krueger.

"For drawing, shaping, and punching aluminum, we use Cities Service Chillo #2 with excellent results. Where drawing, swedging or forming of steel and brass is required, we use Cities Service Chillo 12 and get equally fine results.

"Not only do these two Cities Service oils handle all our jobs and produce the best possible finish, but we also find they increase tool life and hold scrap to a minimum. In short, these are the best oils we have ever seen."

Like Res Manufacturing, chances are your operation can be simplified with the right Cities Service oils. Talk with a Cities Service Lubrication Engineer. Or write: Cities Service Oil Company, Sixty Wall Tower, New York 5, N. Y.

CITIES SERVICE

QUALITY PETROLEUM PRODUCTS

time saved is . . .

money earned

BULLARD

The application of Bullard Mau-Au-Trol Vertical Turret Lathes, Model 75, to the machining of aircraft turbine compressor cases clearly demonstrates the superiority of automatic operation.

According to Mr. George E. Saupe, Chief Manufacturing Engineer at Solar Aircraft Co., San Diego, California, these are some of the advantages:

1 Spoilage practically eliminated.

2 Machining time reduced from 14 hours to 1 hour and 42 minutes per unit.

3 In process inspection unnecessary.

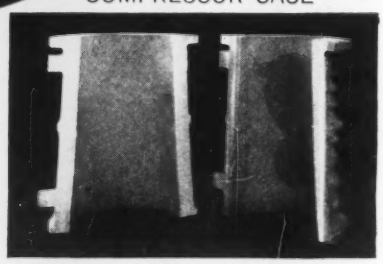
4 Better production control.

5 Reduces error of the operator.

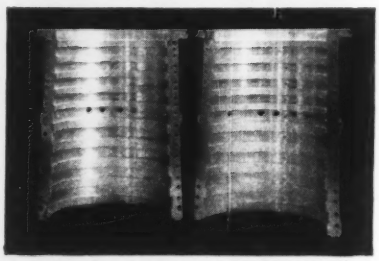
6 Less work in process inventory.

A call, to your nearest Bullard Sales Office or Distributor, can be your first step toward time saved and money earned with your machining problems.

SOLAR JUPITER COMPRESSOR CASE



ROUGH PIECE



FINISHED PIECE

THE BULLARD COMPANY
BRIDGEPORT 9, CONNECTICUT

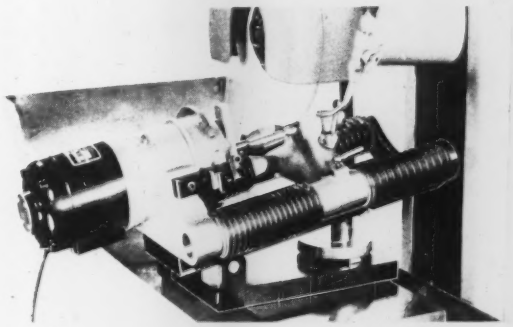
Grinding Attachment Serves as Inspection Instrument

A highly accurate OD cylindrical grinding attachment uses true dead centers which assure concentricity to 0.0001 in. total indicator reading.

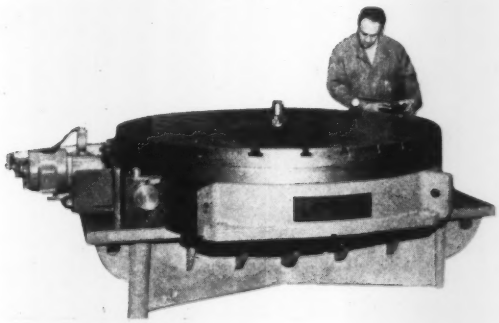
The device also serves as an inspection instrument.

Features include a built-in sine plate and micrometer which permit grinding and inspection of tapers within seconds of an arc, spring loaded tailstock centers, and a micrometer range from −0.025 to +0.025 in. which eliminates the need for gage blocks.

All moving parts are protected from water, coolant, grit, and dust. *Write*: Gebhart Machine Tools Ltd., Glendale, Calif. *Phone*: Chapman 5-4652



Rugged Indexing Machine Retains High Accuracy



A series of universal, automatic rotary indexing machines in table diameters up to 84 in. are suitable for use in heavy drilling, milling, boring, inspection, programming, and tracing. They are also adaptable to broaching.

The Rotomatic Positioner can handle loads up to 50,000 lb with no noticeable deflection or change in indexing. The load need not be balanced.

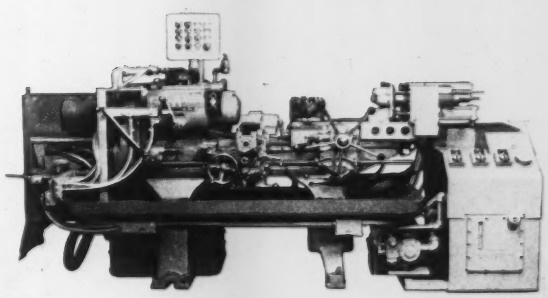
Indexing accuracy is guaranteed within 5 seconds of an arc in the "A" series machines. Indexing can be fully automatic, semiautomatic, or manual. A numerical control attachment is available. The machine is made in horizontal and vertical models. *Write*: Lapointe Machine Tool Co., Hudson, Mass. *Phone*: 850

Turret Lathe Functions Controlled Automatically

The De Silvey Director performs all turret lathe functions formerly done by hand. With this unit operations are from a single control panel—whether automatic, semiautomatic, manual, or intermittent.

Headstock spindle speeds, ram, cross slide functions, and all the operations are preselected by a six-position drum and a multiple switch assembly called a sequence selector. Feed rate ranges from 0 to 100 in. a minute.

An overload eliminator reverses the tool when slide hits dead stop; when tool is dull or broken, it protects the tool and machine from overload. No cams are required for any operation. *Write*: De Silvey Corp., Pennsylvania Avenue, East Aurora, N. Y. *Phone*: Cypress 3300

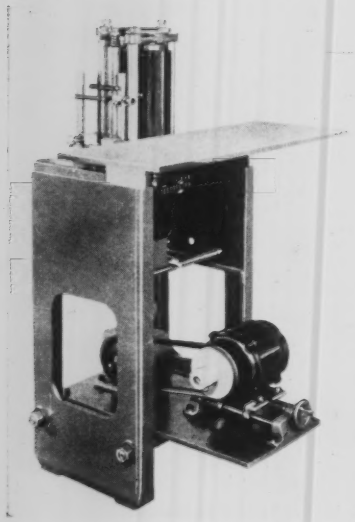


NEW PRODUCTS and equipment

Small Pieces Grained

A gravure-offset machine for printing wood grain patterns (graining) provides low cost and high production on small workpieces.

Model V-44 will continuously print the edges of tables, desk tops, doors, panels, and flat and slightly shaped strips and moldings of any length. It prints on metal, wood, hardboard, veneer, or plastic.



It is powered by an explosion-proof motor. The machine has variable speeds of 25 to 60 fpm. *Write*: Hamant Tool Co. Inc., 512 Warren St., Dayton 9, Ohio. *Phone*: Baldwin 4-4838

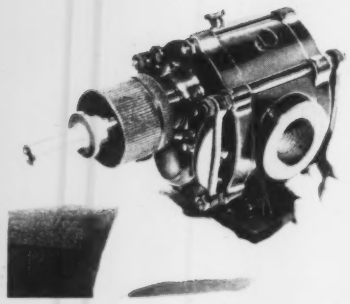
Gear Pump Handles Acids

For low volume, positive displacement pumping of acids, alkalies, and other corrosives, this Ace GKF gear pump features all hard rubber casing and gears, Kel-F bearings, and a rubber covered shaft.

Adaptable to many uses from laboratory work to process pumping, typical applications range from handling acids from carboys and tanks to direct agitation of plating or other solutions.

The hard rubber compound used in the pump is corrosion and wear resistant, and self-lubricating. The direct drive motor is totally enclosed. Stuffing box is conventional, and connections are tapped for 1-in. standard pipe.

Discharge is continuous, positive,



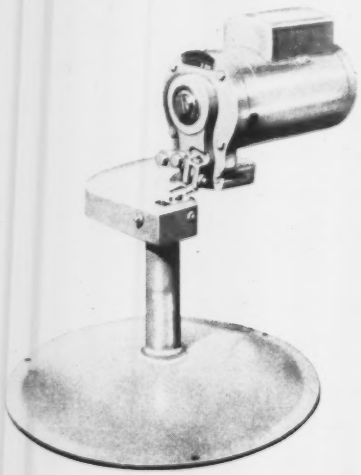
and in direct proportion to speed. Complete with standard ½ hp, 875 rpm motor, the pump delivers about 12 gpm maximum. Head is 120 ft (52 psi). *Write*: American Hard Rubber Co., div. of Amerace C[illegible], Ace Road, Butler, N. J. *Phone*: Butler 9-1000

Shear Turns Full Circle

A column mounted, throatless nibbling shear which operates at 1725 cutting strokes a minute is designed for quick and accurate cutting, slitting, and trimming.

Throatless design permits the work to be turned in any position so that curved, circular, irregular, angle, or straight shapes can be cut. Three models are available: BN-1 with a cutting capacity of 14 gage in mild steel, or 18 gage in stainless; BN-2 for 10 gage mild, or 14 gage in stainless; and the largest, BN-3, for mild steel up to 7 gage, and stainless to 10 gage.

The shears are complete with a standard 30-in. column and base. A 5½-in. column bench base (illustrated) is available. The shear can be swiveled in a full circle,

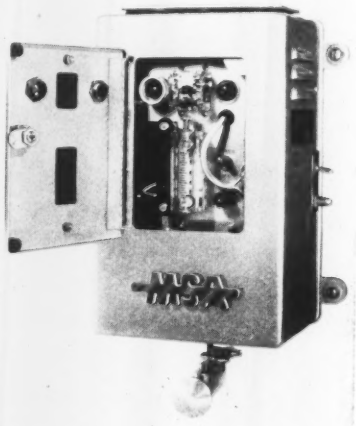


permitting its use in confined areas.

Power is by heavy duty, alternating current motor (60 cycles, 115/230 volts). Machines are shipped with blades and are ready for operation. *Write*: Beverly Shear Mfg. Co., 3001 W. 111th St., Chicago, Ill. *Phone*: Cedarcrest 3-2063

Combustible Gas Alarm

Explosilarm, a small self-contained unit, features minimum first cost and low installation and maintenance costs. It is intended for installation in nonhazardous areas. Up to 100 ft of sample line can be used. It has extreme zero and calibration stability.



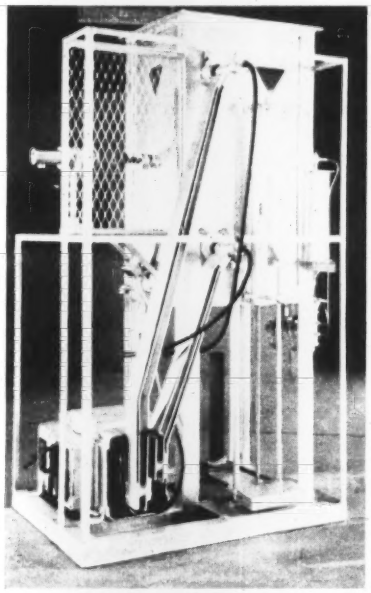
The unit is contained in a cabinet 14¼ by 8¾ by 6¼ in. A locking door panel prevents tampering with controls. *Write*: Mine Safety Appliances Co., 201 N. Braddock Ave., Pittsburgh 8, Pa. *Phone*: Churchill 1-5900

Hydraulics Load Furnace

Ultrahigh temperature research investigations in ceramics or metallurgy can be obtained with the Model CT, 5000° F electric furnace.

In this carbon resistor type tube furnace of vertical design, the workload is raised or lowered hydraulically. The rate of vibrationless movement of the load bearing column can be infinitely controlled through travel range, making it compatible with the specimen being tested. Continuous firings on predetermined schedules can be accomplished.

Controls are capable of holding to ±20° F at 5000° F in inert gas. The design allows a choice of ex-



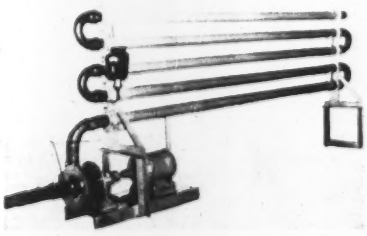
tremely rapid (room temperature to 4500° F in about 2 hours) or any slow cycle heatup.

The case is gastight (gasketed) all welded steel, with removable top for easy access to internal parts. The unit, including control panel, is floor mounted, requiring no special foundation—it can be mounted on casters if desired.

The series is also offered in horizontal design. Tube lengths are 12 in. and are available in 2, 3, or 4 in. ID. *Write*: Pereny Equipment Co., 893 Chambers Rd., Columbus 12, Ohio. *Phone*: Axminster 9-8444

Heat Exchangers

These exchangers are designed for heating or cooling of plating, anodizing, and pickling solutions. They can be provided with graphite, steel, or alloy tubes. Pumps are plastic, steel, stainless, or rubber lined. Fittings are offered in plastic, molded rubber, or PVC. Pumps are sized for all units from 50 to 1200 gpm and can be furnished with or without built-in temperature control.



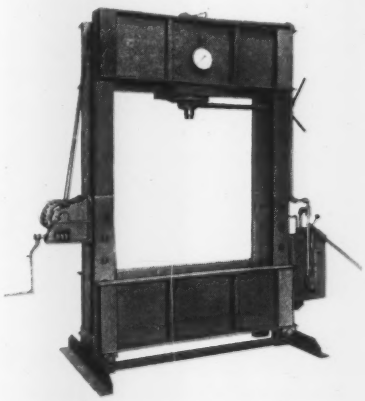
The graphite tube exchanger shown with a plastic pump has proved satisfactory for cooling sulfuric anodizing solutions. *Write*: Carl Buck & Associates, Essex Fells, N. J. *Phone*: Caldwell 6-2283

Press Has Geared Winch

The KRW 37KAA-150 press handles jobs up to 150 tons, yet is sensitive enough to handle those requiring the lightest pressure.

It features a heavy duty, geared winch with load securely held at any point permitting one-man adjustment of bed height. A two-speed, hand operated pump gives accurate control of ram pressure. Open side construction combined with extra large daylight opening permits handling of large bars or shafts.

A handwheel speeds ram to workpiece and can be operated mechanically to 3 tons; the pressure release valve operates at finger pressure.



The unit is available as a hand-operated or motor-driven machine—later motorizing can be done with a KRW conversion package. *Write*: Hydraulics Div., K. R. Wilson Inc., Main Street, Arcade, N. Y.

Tool Wear Indicated

Tool-Gard, a dual purpose, load measuring instrument, gives constant visual tool wear indication, and monitors tool wear and machine operating conditions.

It can be adapted to any machine tool operation where it will reveal the slightest increase or decrease in power consumption. The amount of power being used gives accurate appraisal of tool wear and operating conditions.

When set on Tool-Gard position, it monitors only the tool wear and cancels out the portion of the load that is not important. On Loadmeter position, it monitors machine tool overload or underload. *Write*: Futurmill Inc., 6360 Highland Rd., Pontiac, Mich. *Phone*: Orlando 3-1267

Truck Cushions Loads

The hydraulic load release on these hand lift trucks completely cushions descending loads. For heavy, fragile loads, trucks can be equipped with coil spring frame construction which prevents jars and shocks being transmitted to the load—as in the case of core racks, pottery, or explosives.

Their wheels roll on tapered roller bearings and heat treated axles. Platforms 18 or 24 in. wide and up to 72 in. long are available. The bal-

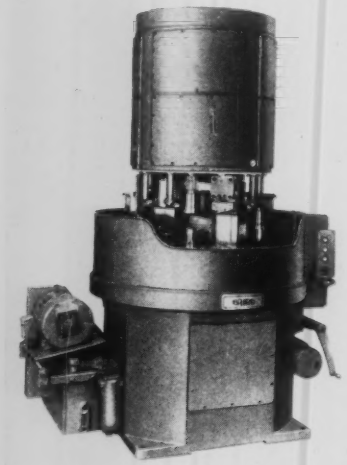
anced, free steering, nonflying handle can lift the truck 3 in. and can steer or lift at any point in a 200-degree arc.

The AJ25N or W handles up to 2500 lb; the AJ4ON or W has a 4000 lb capacity. *Write*: Automatic Transportation Co., division of Yale & Towne Mfg. Co., 149 W. 87th St., Chicago 20, Ill. *Phone*: Radcliffe 3-7000

Multispindle Lathe

This 8-in. lathe has four vertical spindles, which do the same operations.

Work holding is automatic. Spindles stop and release the work as it passes through the load and unload



sector. Each spindle has two vertical and one cross slide tool motions which can be used in any required combination. *Write*: Baird Machine Co., Stratford, Conn. *Phone*: Edison 7-3361

Degreasing

Emcol P-5900, an oil in water emulsifier, has good rinsing characteristics and leaves metal surfaces film-free. A solution of 25 per cent P-5900 in kerosine will permit a tenfold dilution of such aliphatic solvents as Stoddard, diesel fuel oil, and straight kerosine. *Write*: Emulsol Chemical Corp., division of Whitco Chemical Co., 75 E. Wacker Dr., Chicago 1, Ill. *Phone*: Financial 6-2960

NEW literature

Write directly to the company for a copy

Pyrometers

Application information and features of a line of pyrometers are presented in Bulletin GEA-6650, 8 pages. General Electric Co., Schenectady 5, N. Y.

Universal Joints

This bulletin describes standard (3/8 to 4 in.) and custom built joints in both split and solid block types. Borgeson Mfg. Co. Inc., Torrington, Conn.

Heating and Ventilating

Bulletin 8927, 48 pages, describes types, sizes, and construction of units available. Included are data on installation, dimensions, and possible combinations. American Blower Div., American-Standard, Detroit 32, Mich.

Powder Lancing

Form 1164 describes typical applications and shows how this process is used to save time and money. Linde Co., division of Union Carbide Corp., Room 2840, 420 Lexington Ave., New York 17, N. Y.

Corrugated Containers

This 28-page brochure shows successful applications in packaging major appliances. Gaylord Container Corp., division of Crown Zellerbach Corp., St. Louis, Mo.

Corrosion Proof Linings

A handbook covering the three most useful types of polyvinyl chloride lining for corrosion protection contains an introduction to PVC lining applications and practices. A table compares resistance of conventional and unplasticized linings to a wide range of acids, alkalies, salts, plating solutions, organic compounds, and other liquids—evaluated at 70, 120, and 160° F. Kaykor Industries Inc., division of Kaye-Tex Mfg. Corp., Yardville, N. J.

Tracer Type Lathes

Bulletin Q-57 describes Model Q double-way, tracer type automatic lathes. Specifications, features, diagrams of tooling setups, chip disposal methods, and types of turning and squaring carriages are included. Lathes are designed to combine rough and finish turning operations on a single machine. Seneca Falls Machine Co., 14 Fyfe Bldg., Seneca Falls, N. Y.

Indexing Chassis

The Auto-Tran straight line indexing machine chassis can be used as the basis for an automatic special machine or transfer machine. An 8-page booklet explains features. It also shows optional accessories, dimensions, index time, and cycling data. Swanson-Erie Corp., 814 E. Ninth St., Erie, Pa.

Welding Wire Comparison

A 4-page welding wire chart, DH-1812-M, includes recent changes in automatic welding and metal spray wire. It details "as welded" physical properties, gives analysis, tensile strength, elongation, average Rockwell hardness and lists typical uses for gas welding rods, bare electrodes, automatic welding wire, and metal spray wire. Competitive makes are compared. Page Steel & Wire Div., American Chain & Cable Co. Inc., Monessen, Pa.

Titanium Properties

"Commercially Pure Titanium," an 8-page brochure, describes the properties and corrosion resistance of pure titanium. Chemical compositions and mechanical properties are tabled, and physical properties such as melting point, modulus of shear, electrical resistivity, magnetic permeability, coefficient of friction, thermal expansion, and thermal conductivity are discussed. A full-page chart compares the corrosion resistant properties of titanium, zirconium, tantalum, and 316 stainless in a number of corrosive media. Mallory-Sharon Metals Corp., Niles, Ohio.

Heat Treat Data

A Datalog on heat treating processes and equipment covers protective atmosphere annealing, brazing, and hardening of a wide variety of metals, including stainless steel. "Heat Treatments in Atmosphere Furnaces" also discusses the process in continuous, batch, and pit type furnaces. Ferrotherm Co., 1861 E. 65th St., Cleveland 3, Ohio.

Chemical Milling

An illustrated color brochure describes the advantages and engineering applications of chemical milling and the operations involved. Included in its 30 pages is information on processing of magnesium, color anodizing, vacuum cadmium plating, and other metal finishing processes. Anadite Inc., South Gate, Calif.

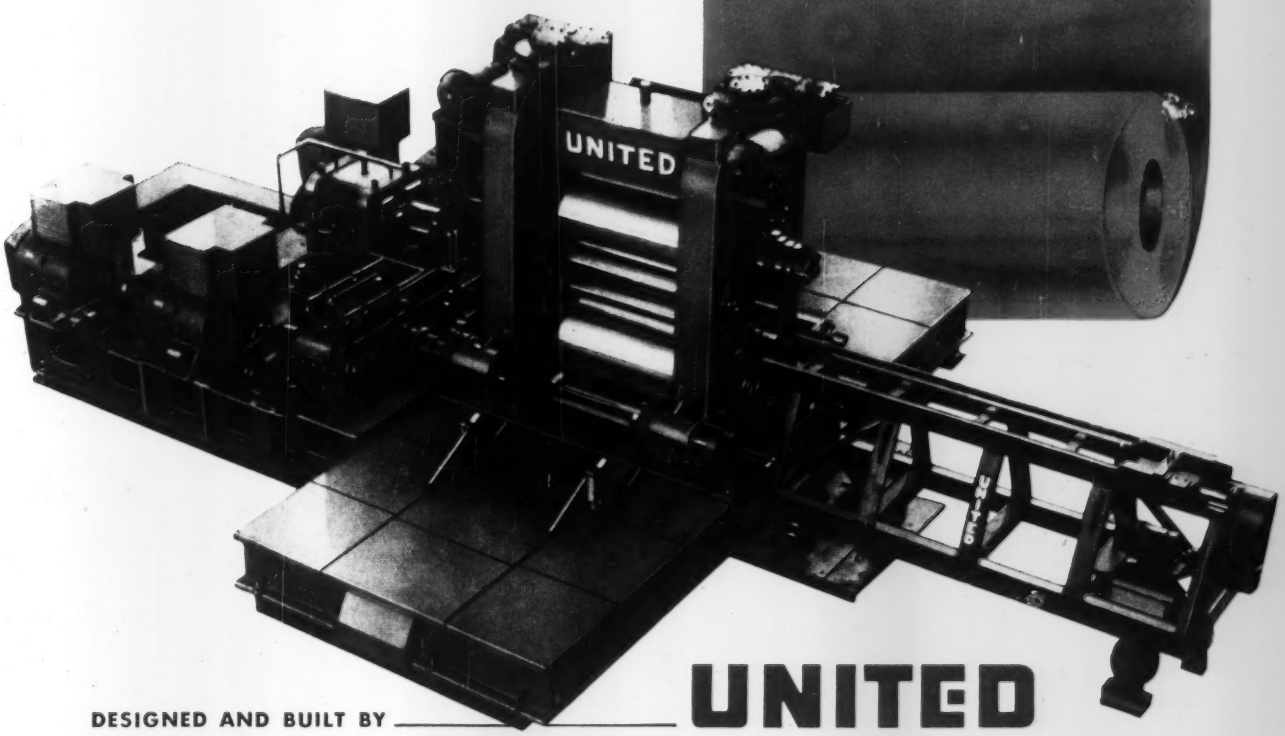
Totally Enclosed Motors

Bulletin 53B8904 describes construction and design features of a line of totally enclosed motors with self-contained heat exchanger for operation in highly contaminated atmospheres. Allis-Chalmers, Milwaukee 1, Wis.

Jig Borers

Detailed photos, specifications, and descriptions of two advanced jig borer models are included in Bulletins 5000 and 6000. The larger is Model 6000 with a worktable space of 20 x 40 in., the smaller Model 5000 has a table 12 x 22 in. Atlantic Machine Tool Works Inc., Newington, Conn.

UNITED ALUMINUM FOIL MILL



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ENGINEERING AND FOUNDRY COMPANY

Pittsburgh, Pennsylvania

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other heavy machinery. Manufacturers of Iron, Nodular Iron and Steel Castings and Weldments.

Plants at: Pittsburgh • Vandergrift • Youngstown • Canton • Wilmington

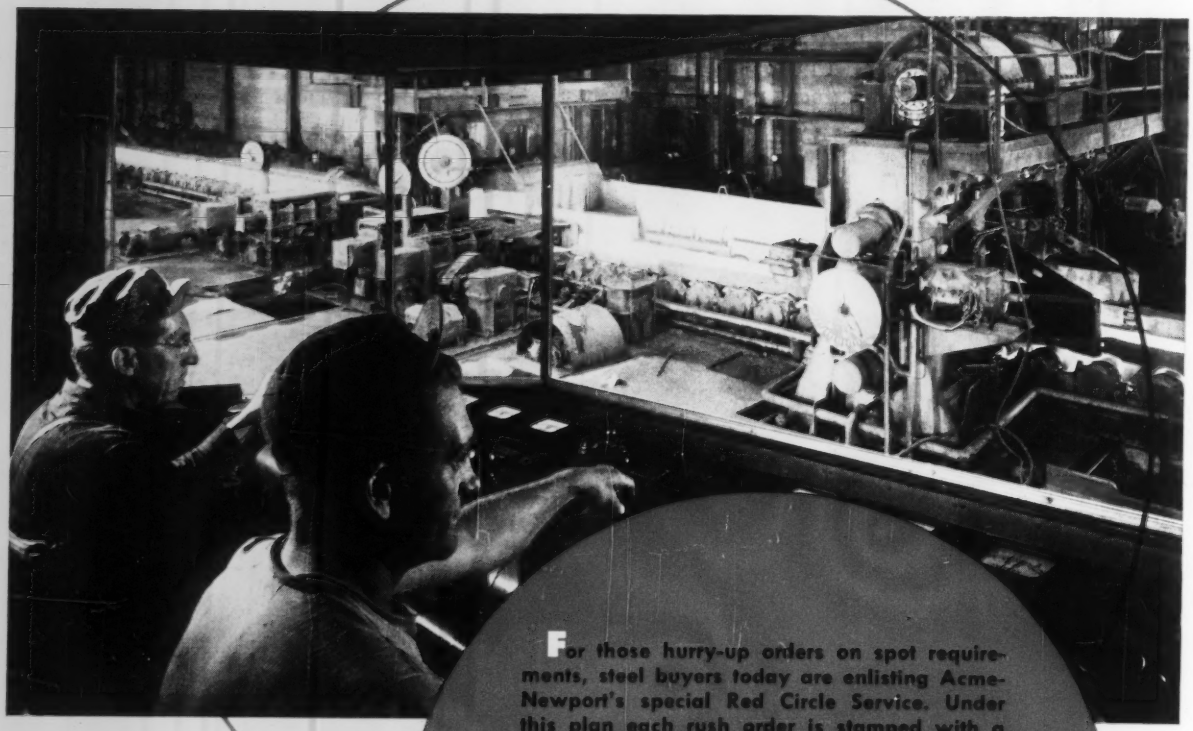
Subsidiaries: Adamson United Company, Akron, Ohio
Stedman Foundry and Machine Co., Inc., Aurora, Ind.

RED CIRCLE SERVICE... SPECIALIZED ATTENTION

THROUGH EVERY DEPARTMENT AT

Acme-Newport Steel

• RED CIRCLE SERVICE



For those hurry-up orders on spot requirements, steel buyers today are enlisting Acme-Newport's special Red Circle Service. Under this plan each rush order is stamped with a bright red circle, which signals the whole mill to expedite processing through every operation. This preferential handling is made possible by the extreme flexibility of a mill this size . . . where efficient scheduling and modern facilities and methods are combined by men well trained in steelmaking.

Let Red Circle Service help in your inventory control, with *steel when you want it!*

PRODUCTS OF ACME-NEWPORT STEEL

HOT ROLLED STEEL IN COIL
HOT ROLLED PICKLED STEEL IN COIL
HOT ROLLED SHEETS
HOT ROLLED PICKLED SHEETS
COLD ROLLED STEEL IN COIL (*Full Hard only*)
COLD ROLLED SHEETS
ALLOY SHEETS AND PLATES
PLATES ($\frac{5}{16}$" *and lighter*)
ELECTRICAL SHEETS
ELECTRIC WELD LINE PIPE

Acme-Newport Steel COMPANY
NEWPORT, KENTUCKY
A SUBSIDIARY OF ACME STEEL COMPANY

Market Outlook

CONSTRUCTION activity is gaining momentum. Improvements are spotty so far, and steelmakers are being cautious. But a continuation of the trend will lift hopes for better production in the next few weeks.

In the first two months of this year, construction took 33 per cent less steel than it did in the same period last year. The dollar volume of contracts was 10 per cent lower than in 1957.

ROADBUILDERS IN GEAR—Chicago producers of reinforcing bars say their backlogs are the best they've had in a long time. They're working close to capacity to fill orders for three toll roads that converge south of the city. In Detroit, the story's much the same. One bar supplier says April sales are 5 per cent above the March level. Several Michigan highway contracts signed last week are expected to boost orders for road building materials.

PICKUP FOR PIPE—Sales of buttweld pipe are also improving with the return of good construction weather. Orders that might have been expected a month ago are coming in from the East as building activity accelerates. Both direct sales and sales to jobbers are affected.

EARLY INTRODUCTIONS?—Signs are multiplying that automakers will show their new models as early as September. Car builders are expected to begin large scale ordering of steel in July for August delivery. In the interim, they'll get along with what they have on hand. Weekly auto production is being scaled down from 87,000 to 80,000 units.

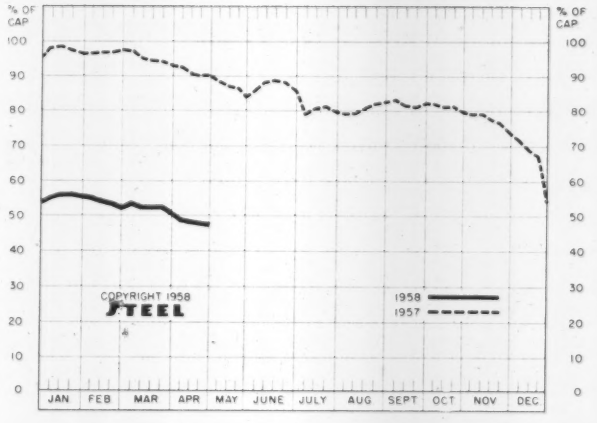
PILLARS OF STRENGTH—In the absence of strong automotive buying, the steel market is getting some support from lesser buyers: Manufacturers of agricultural implements, office furniture and equipment, lawn mowers, household appliances, and cans.

WAREHOUSES PINCHED—A Cleveland warehouse manager reports that sales volume is almost too low to be profitable. He's getting more orders than he did a year ago, but all they add up to is a lot of paperwork. Complaining of mill competition, Chicago warehouses are taking the offensive—adding salesmen, broadening product lines, and modernizing their equipment.

OIL COUNTRY DORMANT—"Oil country goods seem to have fallen into a bottomless pit," says one tube producer. Drastic curtailment of drilling (eight days a month) has resulted in the accumulation of huge pipe and casing inventories. One major oil company has put 28,000 tons of pipe on the market, and some of the small distributors are unloading stock at lower than mill prices. To make matters worse, next month's quota for crude oil production in Texas is 2,394,537 barrels daily, down 42,537 barrels daily from the current allowable.

PRODUCTION SLIPS—Despite indications of a slight pickup in demand, steelmaking declined for the fifth consecutive week. Furnaces were operated at 47 per cent of capacity, down a half point. Production was about 1,270,000 net tons of steel for ingots and castings, the smallest output of any week this year.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

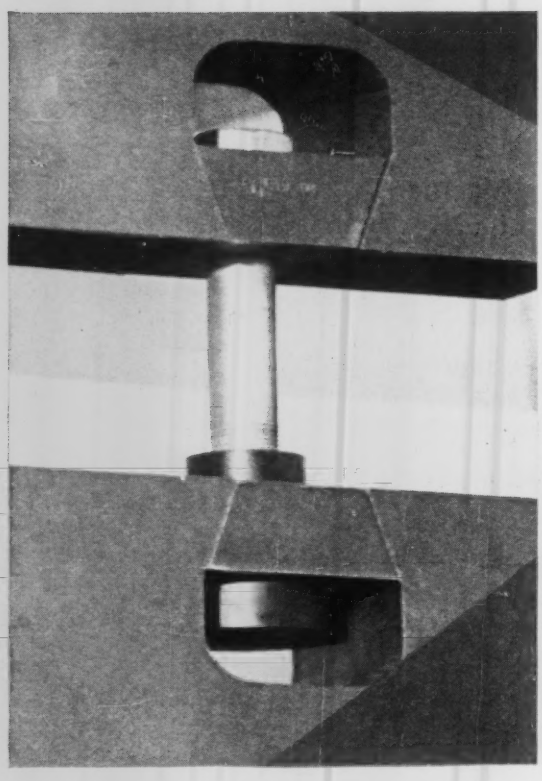
(Percentage of Capacity Engaged)

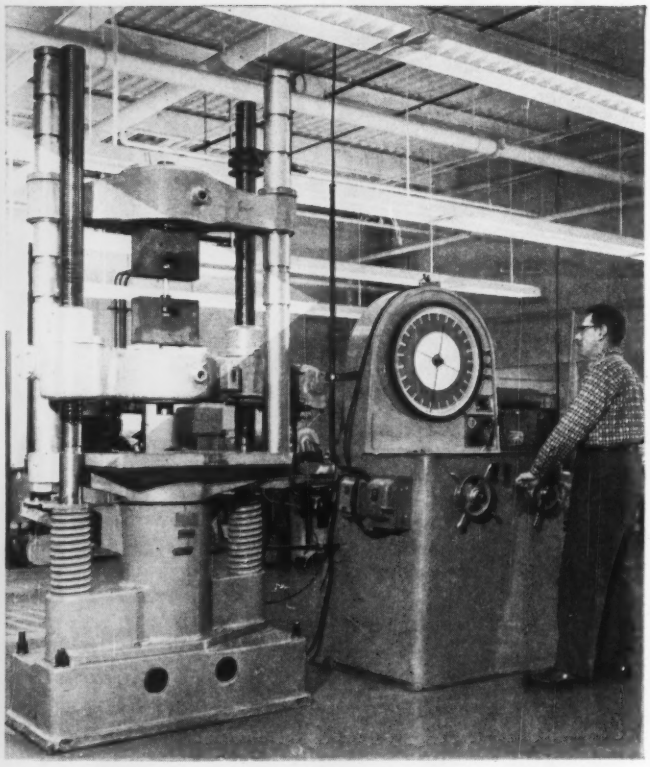
	Week Ended Apr. 27	Change	Same Week 1957	Same Week 1956
Pittsburgh	46.5	— 2.5*	92	106
Chicago	54	+ 1.5*	87	100
Mid-Atlantic	48	— 1	96	99
Youngstown	44	+ 3	90	97
Wheeling	57	— 5	94	96.5
Cleveland	27.5	+ 2*	86.5	95.5
Buffalo	36.5	— 2.5	92.5	105
Birmingham	54	— 0.5	95.5	95.5
New England	40	0	58	87
Cincinnati	29.5	—18.5	65	99
St. Louis	56.5	+ 6	94	96.5
Detroit	13	+ 1*	96.5	97.5
Western	66	+ 1*	103	107
National Rate	47	— 0.5	90	100.5

INGOT PRODUCTION‡

	Week Ended Apr. 27	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	78.7†	80.0	85.0	141.2
NET TONS (In thousands)	1,265†	1,285	1,366	2,269

*Change from preceding week's revised rate. †Estimated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,699,173 in 1958; 2,559,490 in 1957; 2,461,893 in 1956.





Here's a "Good Break" for Bolt Users

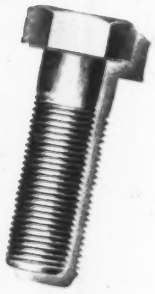
We break bolts on purpose at the Lamson & Sessions Company!

We do it to protect our customers . . . so *we* know and *you* know, the strength and quality of a bolt . . . one you can depend on to do the job required of it.

This machine develops hundreds of thousands of pounds of "pull"—many more than would ever be required on even the toughest holding job. We measure the "break point" and hence can tell our customers the exact margin of safety they can expect.

This is only one of the many tests to which Lamson fasteners are regularly subjected. Many times they prove that a customer can use a smaller, less expensive fastener for a particular holding purpose.

This money-saving service to customers is only one of the many reasons why the biggest bolt buyers in the country *always* consult Lamson & Sessions *first* on their fastener needs. Why don't you?



Lamson's 1038
High-Tensile
Cap Screw

The LAMSON & SESSIONS *Co.*

5000 TIEDEMAN ROAD, CLEVELAND 9, OHIO • PLANTS AT CLEVELAND AND KENT, OHIO • CHICAGO • BIRMINGHAM

Inventory Reduction*: 'X' Marks the Bottom

(Millions of net tons of steel, 1958)

*Steel in all forms except finished products in dealers' hands.
Source: STEEL estimates.

Midyear Pickup Possible

Three factors could boost the steelmaking rate this spring or summer: 1. End of inventory liquidation. 2. Attempts to beat a price increase. 3. Early introduction of '59 autos

INVENTORIES of steel are being whittled away at a near record pace which will reduce them to a working minimum about midyear. Contrary to normal seasonal patterns, you may see an increase in the national steel operating rate this summer as customers start ordering to cover current needs as well as to balance remaining stocks.

The chart above shows the trend of this liquidation during the first half. Market research men may disagree with the figures used. (They claim it is impossible to determine the exact tonnage of steel inventories.) But they agree that the trend is an accurate picture of what is going on in industry.

Starting Point—STEEL arrived at the figure of 19 million tons in stock on Jan. 1 after a study of the American Iron & Steel Institute's figures on monthly shipments of finished steel mill products and the Federal Reserve Board's seasonally adjusted index of metal fabricating. Allowance has been made for the fact that not all metal consumed in fabricating is steel. Market researchers with leading steel companies agree this is a realistic figure from which to start.

Calculations show that the inventory liquidation reached its peak in February, when about 1.7 million tons were taken out of stocks. The March withdrawal amounted to about 1.3 million tons, and it looks like the rate will continue to diminish until about midyear when inventories will be down to about 12 million tons. It is assumed that the relationship of mill shipments to consumption will remain about as it is now.

(Inventory figures do not include finished goods in the hands of dealers. The estimated 800,000 unsold autos represent close to 2 million

tons of steel, according to one estimate. Stocks of 500,000 cars are normal at this season. So the excess car inventories represent an additional 750,000 tons of steel on hand.)

Best Guess—Just what the minimum level of steel inventories will be is anybody's guess, and it will fluctuate with different rates of consumption. But Avery T. Adams, president of Jones & Laughlin Steel Corp., Pittsburgh, voices the opinion of many when he says the reduction will phase out around July 1 at 12.5 million to 13 million tons. At that point, he says, consumers will be "underinventoried."

Some steelmen believe the end of liquidation will come around Aug. 1. One says it'll be over by Labor Day. All agree that 12 million tons (the equivalent of about two months' output at current rates) is about as far as consumers dare go without endangering their production schedules. (They assume the recession is bottoming out.)

PAs Agree—Much of the foregoing is confirmed by the National Association of Purchasing Agents in its April survey of the steel market. Eighty per cent state they are purchasing from 10 to 20 per cent less steel than they are using. And 65 per cent expect to be buying steel for prompt consumption by the end of the second quarter.

Who Has the Steel?—Most of the talk centers on the auto industry, the leading consumer of steel. Detroit informants say that automakers have at least three-fourths of the flat-rolled steel required to finish out the 1958 model run. They may have to exercise options with the mills in June to make up the final one-fourth, but this will probably come in dribbles.

Inquiries for bars and wire for 1959 models are now out, but the bulk of the tonnage for next year's model buildup will not be ordered until mid-July or later. (Introduction dates may be moved up as much as a month this year. See Pages 73-74.)

Others—Producers point out that there is a glut of oil country goods in the Southwest. One steel official says oil drillers are trying to reduce inventories by swapping—drill pipe for tubing or casing, for example. He thinks it will be another six months before these stocks are worn down.

Both the railroad and construction industries also have heavy inventories, but stocks of structural shapes are diminishing as building activity gains headway. Appliance makers are still eating off the shelf, although there has been more order activity from this source than from most since the first of the year.

Why Wait?—Steelmakers point out that a pickup in orders could easily develop before the inventory reduction has run its full course. As stocks decline, imbalance will become a problem, forcing users into the steel market. Some producers already report such order activity in April. May and June will see even more.

Most observers feel that there will not be an abrupt upturn in the market. Consumers probably will not attempt to rebuild inventories until production trends show more promise than they do now. There is the possibility that a flurry might result from attempts to beat the

SR . . . the dc rectifier type welder with new completely sealed semimetallic rectifier, new transformer and new weld stabilized circuit. Result is easiest arc starting ever; maximum arc stability; sounder, denser welds; current that handles all electrodes in all positions! Four models, 200 to 600 amps.
SRH . . . the same revolutionary improvements that set the Gold Star SR above and beyond the performance standards ever before achieved by a dc rectifier type welder. Designed primarily for compactness, the SRH is only 30¼" high — is ideally suited for stacking or paralleling in minimum space. Three models, 200 to 400 amps.
The miller GOLD STAR ALL STAR LINE
300 . . . combination ac/dc welder design comes of age with this new Miller model. Features: new magnetic amplifier circuit; improved wave form; new arc starting control; three electrically controlled current ranges for finest adjustment; instant changeover from ac to dc; built-in high frequency. An entirely fresh concept for inert gas and metallic welding. Four basic models with kits available to convert to seven different types of welders.
300-M . . . an ac welder for inert gas and metallic arc processes. Combines unequalled welding characteristics with Miller's unique electric control circuit which permits precise slow or fast start. Features: built-in high frequency, primary contactor and ½ KVA control transformer. Offered in three basic models of from 200 to 400 amperes with optional water and gas controls available.
Complete particulars on any of the above welders will be sent promptly.
miller ELECTRIC MANUFACTURING COMPANY, INC. Appleton, Wisconsin
Distributed in Canada by Canadian Liquid Air Co., Ltd., Montreal, P. Q.

anticipated steel price hike around July 1. However, these hopes are dimmed somewhat because only 12 per cent of the purchasing agents reporting in the survey expect to take that course.

On the other hand, some manufacturers have told STEEL that they have the money now to buy steel and will do so. They figure they will save more than their money would earn in the bank or in securities. (On July 1, steelworkers will receive wage increases approximating those of 1957. At that time steel prices advanced an average of 4 per cent.)

Extra in the Pot — Steelmakers aren't talking much about their own semifinished stocks. It is known that the hot mills at Ford Motor Co. were able to keep rolling even though steelmaking facilities were shut down. And some stainless producers probably could fill substantial orders without lighting a single furnace.

But the turn in activity is still likely to come sooner than many people expect. An operating rate of over 50 per cent of capacity during the summer months is a definite possibility.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 146 & 147

The advisability of ordering ahead of a likely price increase July 1 will be stressed by sheet sellers as they seek to drum up business among their customers over coming weeks. So far, consumers have been indifferent toward forward covering. In some circles, there is growing skepticism as to the extent prices will be increased.

April has brought out a little more business, but the over-all gain in tonnage has not been impressive. The bulk of orders has been from small users, and for prompt shipment for near term requirements. There is minimum buying for inventory, and, with consumers lacking orders for finished goods and cutting back on their production schedules, inventories are automatically being lengthened.

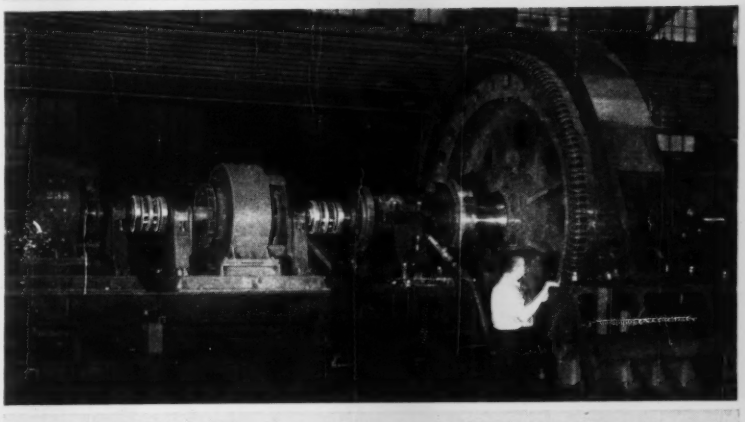
Auto Buying Lags—Cold rolled and hot rolled sheets are moving sluggishly in the Midwest. At Detroit, orders are few and infrequent, some small firms ordering tiny tonnages to balance out inventories. District mills say automotive activity is limited to inquiries and small pilot orders for 1959 model runs. Appliance steel requirements are slow, but a bright spot in this area of the market is the report that Hotpoint Co. is increasing production of its refrigerator lines. Meanwhile, Whirlpool-Seeger Corp. is reportedly scheduling a 40 per cent production cut.

Buffalo area sheet sellers report automotive customers have at least a month's inventory. They think the only thing that would change present cautious auto steel buying would be a sharp upturn in new car sales, and this doesn't seem likely at the moment.

Cold Sheets Gain—Orders for hot-rolled sheets are down from last month at St. Louis, but for cold rolled they are up. A substantial seasonal gain in demand for galvanized sheets is reported at Chicago and other points. The farm trade and construction activity are responsible for this improvement.

April sheet sales are on the upgrade at Pittsburgh. On the basis of orders booked so far this month, district mills predict that

Protect Your Machinery with
THOMAS ALL METAL FLEXIBLE COUPLINGS



NO LUBRICATION NO MAINTENANCE NO WEARING PARTS

Future maintenance costs and shutdowns are eliminated when you install Thomas Flexible Couplings. These all-metal couplings are open for inspection while running.
They will protect your equipment and extend the life of your machines.
Properly installed and operated within rated conditions, Thomas Flexible Couplings should last a lifetime.

Under Load and Misalignment only Thomas Flexible Couplings offer all these advantages:

1 Freedom from Backlash Torsional Rigidity
2 Free End Float
3 Smooth Continuous Drive with Constant Rotational Velocity
4 Visual Inspection While in Operation
5 Original Balance for Life
6 No Lubrication
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For dependable fasteners...

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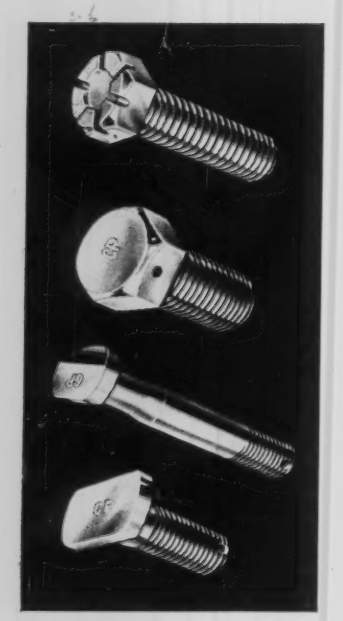

PRECISION CAP SCREWS MASS PRODUCED TO YOUR SPECIFICATIONS

Caught in the "profit squeeze" between rising costs and buyer-resistance, more and more manufacturers are turning to Chandler for cold-headed bolts mass-produced at realistic prices.

Chandler's step-by-step production control and rigid inspection standards assure accuracy, precision and uniformity to meet the most exacting specifications. Using high carbon, alloy, super-alloy and stainless steels, Chandler produces top-quality bolts with special heads or threads, drilled heads or shanks for the automotive, engine and aircraft industries.

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the month's bookings will exceed those in March and February. Makers of office furniture, refrigerators, etc., are taking bigger tonnages.

Although only small tonnages are involved, some sheet suppliers to Ford Motor Co. and American Motors Corp. are optimistic. Ford is ordering more bodies for its Thunderbird, and Rambler is maintaining a robust production schedule.

Strip Mill Down — Armco Steel Corp.'s hot strip mill at Middletown, Ohio, was shut down last week to allow completion of the first phase of a rebuilding program. The mill will be closed 16 days. It is being revamped in connection with a $55 million works improvement and expansion program. A second shutdown of the mill (for 21 days) is planned for July. A third and last shutdown will come at the end of the year.

Kaiser Steel Corp. engineers have started work on relocation of Kaiser's hot strip mill facilities in a massive $214-million expansion program. The project is expected to require six weeks. The new hot strip building, one-half mile long and nearly 330 ft wide, will be the largest finishing facility at the Fontana (Calif.) plant.

Steel Bars . . .

Bar Prices, Page 145

Although large orders are lacking, the steel bar market appears to be slightly more active than it was. Substantial volume from miscellaneous consuming lines is being booked in small lots. The improvement appears to be fairly national in scope, except for the Detroit area.

A Pittsburgh producer of hot bars says: "This month started out much better than March. It's still too early to tell whether we'll beat last month's sales, but we probably won't do any worse."

Farm implement manufacturers are among the better customers ordering from Pittsburgh mills. Since most consumers are buying hand to mouth, a considerable volume of business is going to warehouses.

A Pittsburgh supplier of cold-finished bars says January, February, and March volume were about the same level, and no worse

than that in fourth quarter last year. Incoming orders are about keeping pace with shipments, which are down noticeably from those of a year ago.

At Chicago, a slight pickup in ordering is noted, but orders aren't big. The gain comes from small-lot buying by miscellaneous fabricators. Reason: Many of the smaller plants may be realizing that they've let their inventories dip too low.

Detroit sellers note no pickup in demand, and they don't expect much change until the auto builders start buying again.

A mild improvement in demand for alloy bars on forge shop account is reported in the East.

Wire . . .

Wire Prices, Pages 147 & 148

Except for a mild, but belated, upturn in demand for merchant products, wire mill bookings this month are disappointing. Sellers in some areas report volume in some items is not up to the first quarter rate.

Orders for wire and strand for prestressed concrete structures are moderately heavier. Cold heading and spring requirements are slow with the lag in automotive requirements continuing. Orders for upholstery and bedding coils are also sluggish.

In New England, price-hedge buying is light, and involves covering on wire rods more than finished wire.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 145

The opening of the building season is being accompanied by a spurt in reinforcing steel requirements. In the Midwest, reinforcing provides one of two strong segments in the steel market. The other is tin plate.

Chicago district firms specializing in reinforcing steel are enjoying better backlogs today than they've had for a long time. Tonnagewise, volume is said to equal, or even be a shade higher, than that last year. Toll road, bridge, industrial, and commercial construction in the district is moving right along.

Highway contracts to be signed this week at Lansing, Mich., are expected to bring out a rush of orders for reinforcing fabric. The pickup

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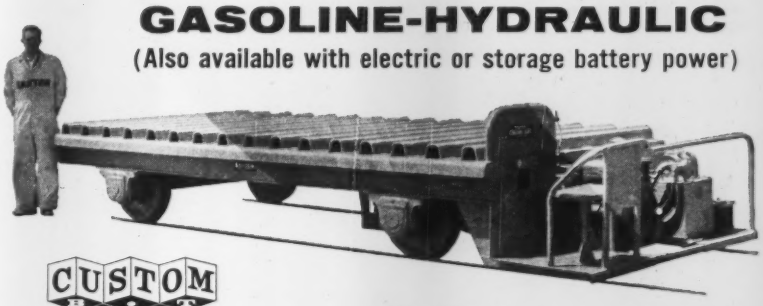

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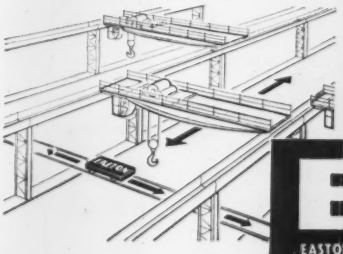

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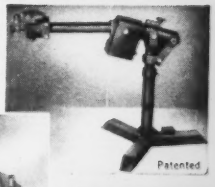

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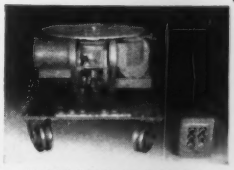

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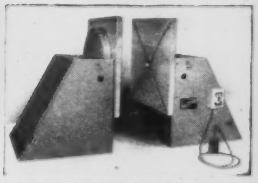

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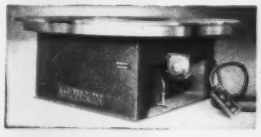

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Where we stand in the fight against CANCER ...and why your dollars are urgently needed now!

DECISIVE PROGRESS has been made in the fight against cancer in the last decade. Today one in every three persons who have cancer is saved. A few years ago it was only one in four.

Still more lives can be saved with what doctors know *now*, if all adults will have a health checkup every year. Many cancers are curable if discovered early and treated promptly.

The major hope for the future conquest of cancer lies in research. About twenty million Americans living today are marked for death from cancer unless research finds new means of curing the disease, or preventing its onset.

What new knowledge has been won to brighten cancer's darkness? High on the list is the discovery of chemicals which cause some cancers to shrink . . . and put victims of this disease back on their feet for a time. There are sound, scientific reasons to believe that more effective chemicals will come which may possibly *cure* one or more forms of cancer.

Equally remarkable are the advances in surgery for cancer . . . permitting wider removal of malignant growths with less risk to patients and far greater chances to control the disease.

The scoreboard of cancer progress also includes methods for treating some cancers with hormones, which prolong the active, useful lives of many patients . . . tests for early diagnosis of some common forms of cancer . . . development of X rays with power undreamed of 10 years ago . . . incredibly delicate techniques by which the living chemistry of a single body cell can be studied.

Immense new research projects are under way and might be expanded to answer such questions as:

> Are the tiny organisms called viruses significant factors in the cause of cancer in man, as they are in some cancers in animals? Why do cancers grow rapidly in some patients, slowly in others? If some people are immune or more immune to cancer than others, how can that immunity be strengthened? What elements in our environment may be causing cancer?

Important findings must be moved from the laboratory table to the hospital bed. The step from test tube to patient is difficult, time-consuming and costly. As research goes forward, and new leads open up, more and more work will be done directly with patients with cancer. Thus, research costs will snowball as science continues to press towards its goal.

Your support of the American Cancer Society's Crusade has already brought significant gains in the control of cancer. More lie ahead . . . will you make them possible? Let your dollars work for you and for your children and for their children.

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in highway business has been slower than had been expected earlier this year.

In the Southwest, heavy importation of foreign material, chiefly reinforcing bars and wire, has been disturbing domestic sellers. But the Texas Highway Department recently banned use of reinforcing steel produced by the bessemer and Thomas processes. The move is expected to help domestic producers, but the regulation does not exclude all foreign reinforcing steel.

Tin Plate . . .

Tin Plate Prices, Page 147

Tin plate is one of the two firm segments of the steel market in the Chicago area (the other is reinforcing steel). Tin mills are engaged at, or near, capacity. Sales match those of the year-ago period.

Tubular Goods . . .

Tubular Goods Prices, Page 149

Sales of buttweld pipe are improving with the return of good construction weather. Orders that had been expected a month ago are coming in from the East, sellers at Pittsburgh report. Both mill and warehouse sales volume reflect the improvement.

Electricweld pipe demand for gas transmission lines is holding up fairly well, and slight gains are also reported for seamless line pipe.

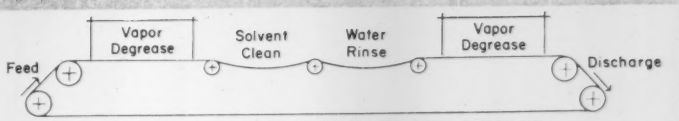
Oil country goods prospects continue discouraging. Drastic curtailment of well drilling (eight days a month) has resulted in huge pipe and casing inventories. Major oil companies are swapping tonnage, and some small distributors are unloading stocks at below mill prices.

Well drilling and exploration will likely continue depressed the rest of this year.

Transwestern Pipeline Co., Houston, is planning a $193 million, 1305-mile pipeline from West Texas to the California-Arizona border. It has applied to the Federal Power Commission to build the line, and if authority to go ahead is granted it will use 30-in. diameter steel pipe over the 670 miles of the system's main line from Roswell westward. Two main 24-in. lateral lines will converge at Roswell.

Two Detroit district tubing sellers report April sales at about the first quarter rate. They don't anticipate

Cambridge WOVEN WIRE BELTS



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any pickup until late third quarter, but, at the same time, they're not expecting any further drop in business. One interest says it notes a slight increase in inquiries, but no increase in orders yet.

Cast iron pipe sales are normal for this season. First quarter bookings were considered satisfactory and substantial volume is expected to be placed over coming weeks.

Pig Iron . . .

Pig Iron Prices, Page 150

With production running at about half the 1957 rate, gray iron foundries bought little pig iron in March. Purchases are slightly heavier this month, but there are no clear indications of any substantial increase through June.

The consensus among foundry suppliers is that the drop in business in the third quarter will be deeper percentagewise than in the past. Vacation periods and slow industrial activity will give the foundries more excuse for longer shutdowns, suppliers believe.

One merchant ironmaker in the Buffalo district is down completely, and another is operating at only 50 per cent of capacity.

Armco Steel Corp., Middletown, Ohio, blew out a blast furnace there last week for a relining job after a five-year campaign—it produced over 2.6 million tons of pig iron, reports Don S. Holdstein, Middletown Works manager. The furnace went into operation Apr. 19, 1953.

Blast Furnace Output Sags

Production of blast furnace products (pig iron, ferromanganese, and spiegeleisen) totaled 4,463,953 net tons in March, reports the American Iron & Steel Institute. Of the total, 4,418,778 tons were pig iron and 45,175 tons were ferroalloys.

Output in the first quarter of this year was 13,382,545 tons (13,220,242 tons of pig iron and 162,303 tons of ferroalloys). Comparative figures follow:

BLAST FURNACE PRODUCTION—MARCH, 1958
(Net Tons)

Districts	March, 1958		March, 1957		Total Year to Date	
	Pig Iron	Ferroalloys	Pig Iron	Ferroalloys	1958	1957
Eastern	964,907	14,713	1,462,010	35,519	3,188,854	4,374,907
Pitts.-Youngstown	1,477,436	26,330	2,532,904	19,947	4,271,569	7,489,756
Cleve.-Detroit	398,273	.....	878,489	.....	1,300,708	2,499,907
Chicago	937,274	.....	1,446,402	.....	2,769,970	4,292,474
Southern	349,889	4,132	501,881	12,313	1,071,288	1,497,056
Western	290,999	.....	357,414	.....	780,156	1,031,655
Totals	4,418,778	45,175	7,179,100	67,779	13,382,545	21,185,755

Iron Ore . . .

Iron Ore Prices, Page 151

Iron ore imports in January totaled 1,785,210 gross tons valued at $14,537,304, says the U. S. Bureau of Mines. In January, 1957, the figures were 1,691,591 tons valued at $13,146,286. Here are the comparisons:

IRON ORE IMPORTS—JANUARY, 1957-58
(Gross tons)

Source	1958	1957
Brazil	78,991	83,739
Canada	3,824	9,904
Chile	307,003	220,388
Denmark	49	14,700
Liberia	39,926	52,150
Mexico	24,744	13,045
Peru	195,852	236,750
Sweden	32,189	44,256
United Kingdom	28	28
Venezuela	1,102,604	1,003,584
British W. Africa	.....	9,800

Stainless Steel . . .

Stainless Steel Prices, Page 149

Failure of stainless steel order volume to improve this month is attributed to inventories and slow consumption, particularly by the automotive industry.

One Detroit area producer, though, says orders are up about 5 per cent over those booked in March, which month's volume was 10 per cent over that in February. This maker says none of the business is on automotive account, but comes largely from commercial construction.

Plates . . .

Plate Prices, Page 145

Fabricating shops are estimating slightly more plate tonnage, but some of them are inclined to hold off the placement of mill orders until contracts have been booked. Even then, a substantial portion of needs is being filled from inventories.

This cautious procurement policy is particularly noticeable with weldment and specialty shops. Demand for plate specialties now is falling off after having held at a relatively higher level than that for carbon plates.

Tank builders are experiencing a slight seasonal upturn in business. They are drawing on their inventories to meet at least a portion of their expanded requirements. Some shops built up stocks of standard size tanks fabricated from light gage plates to meet the bulge in buying.

Shipyards are placing more plate tonnage. The Navy is also inquiring for substantial volume.

Pittsburgh makers say inquiry is a little sharper. It's still too early to tell whether April bookings there will top March volume, but sales executives are hopeful with orders rising.

The outlook for May: Better business as construction gains momentum and consumers exhaust their inventories.

Structural Shapes . . .

Structural Shape Prices, Page 145

"We're a little more optimistic," says a Pittsburgh producer of structural shapes. "We're getting more inquiries, and bookings are rising slightly."

In general, that comment pretty well sums up opinion in the structural steel market. There's little expectation that a dramatic upturn in activity will be experienced in the near future, but sellers think each month will bring additional construction to the market, hastening the time when fabricators and warehouses will have to replenish their steel inventories.

Fabricating shops are well stocked with plain material, notably standard shapes, and they are buying only fill-in sizes to meet new contract requirements.

Prices for fabricated work are highly competitive on all classes of jobs.

Some mill officials report a seasonal pickup in requirements for wide flange beams, but they indicate that standard shapes are moving slowly.

Slightly more tonnage is being estimated in the East, bridges accounting for the bulk of the increase. Prestressed concrete is being specified more frequently in small-span design.

Industrial and commercial building shows only a slight seasonal rise. At Detroit, most capital expansion programs have been postponed by major firms until late 1959. Some buying for commercial structures is noted, several of these being built in Detroit suburbs. Tonnages are relatively small.

(*Please turn to Page 153*)

Price Indexes and Composites

Apr. 22, 1958	Week Ago	Month Ago	Mar. Avg	Year Ago
181.6	181.6	181.6	181.6	174.0

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Apr. 22

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.600	Bars, Reinforcing	6.135
Rails, Light, 40 lb	7.067	Bars, C.F., Carbon	10.360
Tie Plates	6.600	Bars, C.F., Alloy	13.875
Axles, Railway	9.825	Bars, C.F., Stainless, 302 (lb)	0.553
Wheels, Freight Car, 33 in. (per wheel)	60.000	Sheets, H.R., Carbon	6.192
Plates, Carbon	6.150	Sheets, C.R., Carbon	7.089
Structural Shapes	5.942	Sheets, Galvanized	8.270
Bars, Tool Steel, Carbon (lb)	0.535	Sheets, C.R., Stainless, 302 (lb)	0.688
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.650	Sheets, Electrical	12.025
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.355	Strip, C.R., Carbon	9.243
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.850	Strip, C.R., Stainless, 430 (lb)	0.493
Bars, H.R., Alloy	10.525	Strip, H.R., Carbon	6.095
Bars, H.R., Stainless, 303 (lb)	0.525	Pipe, Black, Buttweld (100 ft)	19.814
Bars, H.R., Carbon	6.425	Pipe, Galv., Buttweld (100 ft)	23.264
		Pipe, Line (100 ft)	199.023
		Casing, Oil Well, Carbon (100 ft)	194.499
		Casing, Oil Well, Alloy (100 ft)	304.610
		Tubes, Boiler (100 ft)	49.130
		Tubing, Mechanical, Carbon (100 ft)	24.953
		Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
		Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	9.783
		Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.483
		Black Plate, Canmaking Quality (95 lb base box)	7.583
		Wire, Drawn, Carbon	10.225
		Wire, Drawn, Stainless, 430 (lb)	0.653
		Bale Ties (bundles)	7.967
		Nails, Wire, 8d Common	9.828
		Wire, Barbed (80-rod spool)	8.719
		Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	Apr. 23 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	239.15	239.15	239.15	227.41	181.31
Index in cents per lb	6.479	6.479	6.479	6.161	4.912

STEEL's ARITHMETICAL PRICE COMPOSITES*

Finished Steel, NT	$145.42	$145.42	$145.42	$139.71	$110.98
No. 2 Fdry Pig Iron, GT	66.49	66.49	66.49	64.70	55.04
Basic Pig Iron, GT	65.99	65.99	65.99	64.23	54.66
Malleable Pig Iron, GT	67.27	67.27	67.27	65.77	55.77
Steelmaking Scrap, GT	32.83	33.50	34.50	42.50	42.67

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Apr. 23 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.425	5.425	5.425	5.075	3.95
Bars, H.R., Chicago	5.425	5.425	5.425	5.075	3.95
Bars, H.R., deld Philadelphia	5.725	5.725	5.725	5.365	4.502
Bars, C.F., Pittsburgh	7.30*	7.30*	7.30*	6.85*	4.925
Shapes, Std., Pittsburgh	5.275	5.275	5.275	5.00	3.85
Shapes, Std., Chicago	5.275	5.275	5.275	5.00	3.85
Shapes, deld., Philadelphia	5.545	5.545	5.545	5.31	4.13
Plates, Pittsburgh	5.10	5.10	5.10	4.85	3.90
Plates, Chicago	5.10	5.10	5.10	4.85	3.90
Plates, Coatesville, Pa.	5.10	5.10	5.10	5.25	4.35
Plates, Sparrows Point, Md.	5.10	5.10	5.10	4.85	3.90
Plates, Claymont, Del.	5.10	5.10	5.10	5.70	4.35
Sheets, H.R., Pittsburgh	4.925	4.925	4.925	4.675	3.775
Sheets, H.R., Chicago	4.925	4.925	4.925	4.675	3.775
Sheets, C.R., Pittsburgh	6.05	6.05	6.05	5.75	4.575
Sheets, C.R., Chicago	6.05	6.05	6.05	5.75	4.575
Sheets, C.R., Detroit	6.05-6.15	6.05-6.15	6.05-6.15	5.75-5.85	4.775
Sheets, Galv., Pittsburgh	6.60	6.60	6.60	6.30	5.075
Strip, H.R., Pittsburgh	4.925	4.925	4.925	4.675	3.975-4.225
Strip, H.R., Chicago	4.925	4.925	4.925	4.675	3.725
Strip, C.R., Pittsburgh	7.15	7.15	7.15	6.85	5.10-5.80
Strip, C.R., Chicago	7.15	7.15	7.15	6.85	5.35
Strip, C.R., Detroit	7.25	7.25	7.25	6.95	5.30-6.05
Wire, Basic, Pittsburgh	7.65	7.65	7.65	7.20	5.225-5.475
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.49	6.35
Tin plate (1.50 lb) box, Pitts.	$10.30	$10.30	$10.30	$9.95	$8.95

*Including 0.35c for special quality.

SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$96.00	$96.00	$96.00	$91.50	$70.50
Wire rods, ½-⅝" Pitts.	6.15	6.15	6.15	5.80	4.425

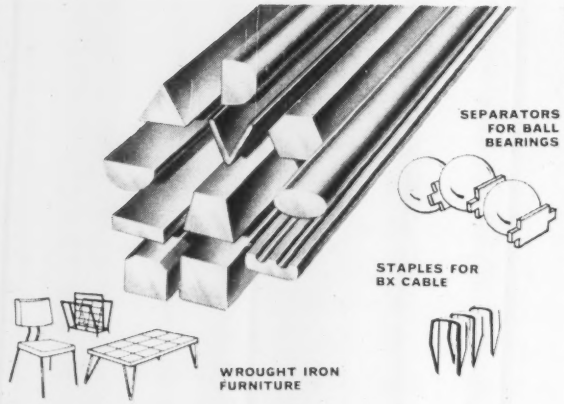
PIG IRON, Gross Ton	Apr. 23 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$65.50	$55.50
Basic, Valley	66.00	66.00	66.00	64.50	54.50
Basic, deld., Phila.	70.41	70.41	70.41	68.38	59.25
No. 2 Fdry, Neville Island, Pa.	66.50	66.50	66.50	65.00	55.00
No. 2 Fdry, Chicago	66.50	66.50	66.50	65.00	55.00
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	68.88	59.75
No. 2 Fdry, Birm.	62.50	62.50	62.50	59.00	51.38
No. 2 Fdry (Birm.) deld. Cin.	70.20	70.20	70.20	66.70	58.93
Malleable, Valley	66.50	66.50	66.50	65.00	55.00
Malleable, Chicago	66.50	66.50	66.50	65.00	55.00
Ferromanganese, Duquesne.	245.00†	245.00†	245.00†	255.00†	228.00*

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$32.50	$33.50	$34.50	$41.50	$44.00
No. 1 Heavy Melt, E. Pa.	36.00	37.00	38.50	46.00	43.50
No. 1 Heavy Melt, Chicago	30.00	30.00	30.50	40.00	40.50
No. 1 Heavy Melt, Valley	32.50	32.50	34.50	41.50	42.00
No. 1 Heavy Melt, Cleve.	29.50	29.50	31.50	38.50	42.00
No. 1 Heavy Melt, Buffalo	26.50	28.50	28.50	41.50	45.50
Rails, Rerolling, Chicago	52.00	53.50	54.50	56.50	51.50
No. 1 Cast, Chicago	38.50	38.50	41.50	39.50	42.50

COKE, Net Ton					
Beehive, Furn., Connisvl.	$15.25	$15.25	$15.25	$15.25	$14.75
Beehive, Fdry., Connisvl.	18.25	18.25	18.25	18.00	17.00

ROUND WIRE—Sizes and finishes to meet almost any specification—$\frac{9}{16}$" on down, in coppered, tinned, bright, galvanized, and other finishes. Made with exactness and uniformity to insure excellent forming and workability. Mill catchweight coils up to 600# or single length Econo-Coils up to 3000# can be supplied, depending on quality, finish and gauge.

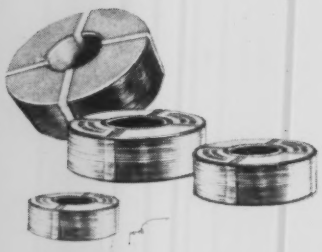


STANDARD AND SPECIAL SHAPES—Cut costs where it counts most—on forging, stamping, rolling and machining for moldings, product trim or other fabrication. Many shapes and sizes are available—V-shaped, oval, square, rectangular, keystone-shaped, and others. It will pay you to check their many cost-saving possibilities.

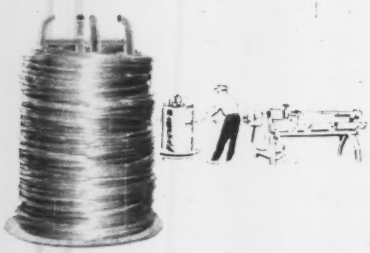
You can do it BETTER at LESS COST with...

CONTINENTAL® WIRE

In practically any size, finish, temper or analysis in low and medium low carbon steels



FINE AND SPECIALTY WIRE
Staple wire, tag wire, shoe wire, florists wire, pin wire, coil binding wire—an almost endless list of fine wire for special application. Many finishes, tempers and sizes.



ECONO-COIL Continuous length wire coils of 2000# to 3000# catchweight, in sizes from 12 gauge through $\frac{1}{2}$" diameter. Reduces scrap loss up to 90 percent. Shipped on returnable Econo-Coil reels.

LEVERPAK—FOR FASTER, CLEANER WIRE HANDLING
Saves scrap, reduces down time. Protects wire from moisture, dirt, and the damage of ordinary handling. Permits long, uninterrupted runs of 500# to 650#. Easy to ship and store.

Send today for Data on Wire
Profit by our thousands of case histories that may point the way to significant savings for you... with Continental Wire.

Wire Specialists for over Half a Century

CONTINENTAL
STEEL CORPORATION • KOKOMO, INDIANA

PRODUCERS OF: Manufacturer's Wire in many sizes, tempers, and finishes, including Galvanized, KOKOTE, Flame-Sealed, Coppered, Tinned, Annealed, Liquor Finished, Bright and special shaped wire. Also Welded Wire Reinforcing Fabric, Nails, Continental Chain Link Fence, and other products.

Steel Prices

Mill prices as reported to STEEL, Apr. 23, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key to producers, page 146; to footnotes, page 148.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ..... $73.50

INGOTS, Alloy (NT)
Detroit S41 ..... $77.00
Farrell,Pa. S3 ..... 77.00
Lowellville,O. S3 ..... 77.00
Midland,Pa. C18 ..... 77.00
Munhall,Pa. U5 ..... 77.00
Sharon,Pa. S3 ..... 77.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ..... $77.50
Buffalo R2 ..... 77.50
Clairton,Pa. U5 ..... 77.50
Ensley,Ala. T2 ..... 77.50
Fairfield,Ala. T2 ..... 77.50
Fontana,Calif. K1 ..... 88.00
Gary,Ind. U5 ..... 77.50
Johnstown,Pa. B3 ..... 77.50
Lackawanna,N.Y. B2 ..... 77.50
Munhall,Pa. U5 ..... 77.50
Owensboro,Ky. G8 ..... 77.50
S.Chicago,Ill. R2, U5 ..... 77.50
S.Duquesne,Pa. U5 ..... 77.50
Sterling,Ill. N15 ..... 77.50
Youngstown R2 ..... 77.50

Carbon, Forging (NT)
Bessemer,Pa. U5 ..... $96.00
Buffalo R2 ..... 96.00
Canton,O. R2 ..... 98.50
Clairton,Pa. U5 ..... 96.00
Conshohocken,Pa. A3 .. 101.00
Ensley,Ala. T2 ..... 96.00
Fairfield,Ala. T2 ..... 96.00
Fontana,Calif. K1 ..... 105.50
Gary,Ind. U5 ..... 96.00
Geneva,Utah C11 ..... 96.00
Houston S5 ..... 101.00
Johnstown,Pa. B2 ..... 96.00
Lackawanna,N.Y. B2 .. 96.00
LosAngeles B3 ..... 105.50
Midland,Pa. C18 ..... 96.00
Munhall,Pa. U5 ..... 96.00
Owensboro,Ky. G8 ..... 96.00
Seattle B3 ..... 109.50
Sharon,Pa. S3 ..... 96.00
S.Chicago R2, U5, W14 .. 96.00
S.Duquesne,Pa. U5 ... 96.00
S.SanFrancisco B3 .. 105.50
Warren,O. C17 ..... 96.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ... $114.00
Bridgeport,Conn. C32 . 114.00
Buffalo R2 ..... 114.00
Canton,O. R2, T7 .... 114.00
Conshohocken,Pa. A3 . 121.00
Detroit S41 ..... 114.00
Economy,Pa. B14 .... 114.00
Farrell,Pa. S3 ..... 114.00
Fontana,Calif. K1 ... 135.00
Gary,Ind. U5 ..... 114.00
Houston S5 ..... 119.00
Ind.Harbor,Ind. Y1 .. 114.00
Johnstown,Pa. B2 .... 114.00
Lackawanna,N.Y. B2 . 114.00
LosAngeles B3 ..... 134.00
Lowellville,O. S3 ..... 114.00
Massillon,O. R2 ..... 114.00
Midland,Pa. C18 ..... 114.00
Munhall,Pa. U5 ..... 114.00
Owensboro,Ky. G8 ..... 114.00
Sharon,Pa. S3 ..... 114.00
S.Chicago R2,U5,W14 .. 114.00
S.Duquesne,Pa. U5 .. 114.00
Struthers,O. Y1 ..... 114.00
Warren,O. C17 ..... 114.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ..... $117.50
Canton,O. R2 ..... 120.00
Cleveland R2 ..... 117.50
Gary,Ind. U5 ..... 117.50
S.Chicago,Ill. R2, W14 117.50
S.Duquesne,Pa. U5 ... 117.50
Warren,O. C17 ..... 117.50

SKELP
Aliquippa,Pa. J5 ..... 5.075
Munhall,Pa. U5 ..... 4.875
Pittsburgh J5 ..... 5.075
Warren,O. R2 ..... 4.875
Youngstown R2, U5 .. 4.875

WIRE RODS
AlabamaCity,Ala. R2 ... 6.15
Aliquippa,Pa. J5 ..... 6.15
Alton,Ill. L1 ..... 6.35
Buffalo W12 ..... 6.15
Cleveland A7 ..... 6.15
Donora,Pa. A7 ..... 6.15
Fairfield,Ala. T2 ..... 6.15
Houston S5 ..... 6.40
IndianaHarbor,Ind. Y1 .. 6.15
Johnstown,Pa. B2 ..... 6.15
Joliet,Ill. A7 ..... 6.15
KansasCity,Mo. S5 ... 6.40
Kokomo,Ind. C16 ..... 6.25
LosAngeles B3 ..... 6.95
Minnequa,Colo. C10 ... 6.40
Monessen,Pa. P7 ..... 6.15
N.Tonawanda,N.Y. B11 . 6.15
Pittsburg,Calif. C11 .... 6.95
Portsmouth,O. P12 ..... 6.15
Roebling,N.J. R5 ..... 6.25
S.Chicago,Ill. R2 ..... 6.15
SparrowsPoint,Md. B2 .. 6.25
Sterling,Ill.(1) N15 .... 6.15
Sterling,Ill. N15 ..... 6.25
Struthers,O. Y1 ..... 6.15
Worcester,Mass. A7 .... 6.45

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 .. 5.275
Atlanta A11 ..... 5.475
Aliquippa,Pa. J5 ..... 5.275
Bessemer,Ala. T2 ..... 5.275
Bethlehem,Pa. B2 ..... 5.325
Birmingham C15 ..... 5.275
Clairton,Pa. U5 ..... 5.275
Fairfield,Ala. T2 ..... 5.275
Fontana,Calif. K1 ..... 6.075
Gary,Ind. U5 ..... 5.275
Geneva,Utah C11 ..... 5.275
Houston S5 ..... 5.375
Ind.Harbor,Ind. I-2 .. 5.275
Johnstown,Pa. B2 ..... 5.325
Joliet,Ill. P22 ..... 5.275
KansasCity,Mo. S5 ... 5.375
Lackawanna,N.Y. B2 .. 5.325
LosAngeles B3 ..... 5.975
Minnequa,Colo. C10 ... 5.575
Munhall,Pa. U5 ..... 5.275
Niles,Calif. P1 ..... 5.925
Phoenixville,Pa. P4 ... 5.325
Portland,Oreg. O4 .... 6.025
Seattle B3 ..... 6.025
S.Chicago,Ill. U5, W14 5.275
S.SanFrancisco B3 .... 5.925
Sterling,Ill. N15 ..... 5.275
Torrance,Calif. C11 ... 5.975
Weirton,W.Va. W6 .... 5.275

Wide Flange
Bethlehem,Pa. B2 .... 5.325
Clairton,Pa. U5 ..... 5.275
Fontana,Calif. K1 .... 6.225
IndianaHarbor,Ind. I-2 . 5.275
Lackawanna,N.Y. B2 .. 5.325
Munhall,Pa. U5 ..... 5.275
Phoenixville,Pa. P4 ... 5.325
S.Chicago,Ill. U5 ..... 5.275
Weirton,W.Va. W6 .... 5.275

Alloy Std. Shapes
Aliquippa,Pa. J5 ..... 6.55
Clairton,Pa. U5 ..... 6.55
Gary,Ind. U5 ..... 6.55
Houston S5 ..... 6.65
KansasCity,Mo. S5 .... 6.65
Munhall,Pa. U5 ..... 6.55
S.Chicago,Ill. U5 ..... 6.55

H.S., L.A. Std. Shapes
Aliquippa,Pa. J5 ..... 7.75
Bessemer,Ala. T2 ..... 7.75
Bethlehem,Pa. B2 ..... 7.80
Clairton,Pa. U5 ..... 7.75
Fairfield,Ala. T2 ..... 7.75
Fontana,Calif. K1 .... 8.55
Gary,Ind. U5 ..... 7.75
Geneva,Utah C11 ..... 7.75
Houston S5 ..... 7.85
Ind.Harbor,Ind. I-2, Y1 7.75
Johnstown,Pa. B2 ..... 7.80
KansasCity,Mo. S5 .... 7.85
Lackawanna,N.Y. B2 .. 7.80
LosAngeles B3 ..... 8.45
Munhall,Pa. U5 ..... 7.75
Seattle B3 ..... 8.50
S.Chicago,Ill. U5, W14 . 7.75
S.SanFrancisco B3 .... 8.40
Struthers,O. Y1 ..... 7.75

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 ..... 7.80
Lackawanna,N.Y. B2 .. 7.80
Munhall,Pa. U5 ..... 7.75
S.Chicago,Ill. U5 ..... 7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 .... 5.325
Lackawanna,N.Y. B2 .. 5.325
Munhall,Pa. U5 ..... 5.275
S.Chicago,Ill. U5 .... 5.275

STEEL SHEET PILING
Lackawanna,N.Y. B2 .. 6.225
Munhall,Pa. U5 ..... 6.225
S.Chicago,Ill. U5 .... 6.225
Weirton,W.Va. W6 .... 6.225

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 .. 5.10
Aliquippa,Pa. J5 ..... 5.10
Ashland,Ky.(15) A10 ... 5.10
Atlanta A11 ..... 5.30
Bessemer,Ala. T2 ..... 5.10
Clairton,Pa. U5 ..... 5.10
Claymont,Del. C22 ..... 5.10
Cleveland J5, R2 ..... 5.20
Coatesville,Pa. L7 ..... 5.10
Conshohocken,Pa. A3 .. 5.20
Ecorse,Mich. G5 ..... 5.20
Fairfield,Ala. T2 ..... 5.10
Fontana,Calif.(30) K1 .. 5.90
Gary,Ind. U5 ..... 5.10
Geneva,Utah C11 ..... 5.10
GraniteCity,Ill. G4 .... 5.30
Harrisburg,Pa. P4 ..... 5.10
Houston S5 ..... 5.20
Ind.Harbor,Ind. I-2, Y1 . 5.10
Johnstown,Pa. B2 ..... 5.10
Lackawanna,N.Y. B2 .... 5.10
LoneStar,Tex. L6 ..... 5.20
Mansfield,O. E6 ..... 5.10
Minnequa,Colo. C10 .... 5.95
Munhall,Pa. U5 ..... 5.10
Newport,Ky. A2 ..... 5.10
Pittsburgh J5 ..... 5.10
Riverdale,Ill. A1 ..... 5.10
Seattle B3 ..... 6.00
Sharon,Pa. S3 ..... 5.10
S.Chicago,Ill. U5, W14 .. 5.10
SparrowsPoint,Md. B2 .. 5.10
Sterling,Ill. N15 ..... 5.10
Steubenville,O. W10 .... 5.10
Warren,O. R2 ..... 5.10
Youngstown U5, Y1 .... 5.10

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 .... 6.75
Fontana,Calif. K1 ..... 7.55
Geneva,Utah C11 ..... 6.75
Houston S5 ..... 6.85
Johnstown,Pa. B2 ..... 6.75
SparrowsPoint,Md. B2 .. 6.75

PLATES, Wrought Iron
Economy,Pa. B14 ..... 13.15

PLATES, H.S., L.A.
Aliquippa,Pa. J5 ..... 7.625
Bessemer,Ala. T2 ..... 7.625
Clairton,Pa. U5 ..... 7.625
Claymont,Del. C22 .... 7.625
Cleveland J5, R2 ..... 7.625
Coatesville,Pa. L7 ..... 7.925
Conshohocken,Pa. A3 .. 7.625
Economy,Pa. B14 ..... 7.625
Ecorse,Mich. G5 ..... 7.725
Fairfield,Ala. T2 ..... 7.625
Farrell,Pa. S3 ..... 7.625
Fontana,Calif.(30) K1 . 8.425
Gary,Ind. U5 ..... 7.625
Geneva,Utah C11 ..... 7.625
Houston S5 ..... 7.725
Ind.Harbor,Ind. I-2, Y1 . 7.625
Johnstown,Pa. B2 ..... 7.625
Munhall,Pa. U5 ..... 7.625
Pittsburgh J5 ..... 7.625
Seattle B3 ..... 8.525
Sharon,Pa. S3 ..... 7.625
S.Chicago,Ill. U5, W14 . 7.625
SparrowsPoint,Md. B2 .. 7.625
Warren,O. R2 ..... 7.625
Youngstown U5 ..... 7.625

PLATES, ALLOY
Aliquippa,Pa. J5 ..... 7.20
Claymont,Del. C22 ..... 7.20
Coatesville,Pa. L7 ..... 7.20
Economy,Pa. B14 ..... 7.20
Fontana,Calif. K1 ..... 8.00
Gary,Ind. U5 ..... 7.20
Houston S5 ..... 7.30
Ind.Harbor,Ind. Y1 .... 7.20
Johnstown,Pa. B2 ..... 7.20
Lowellville,O. S3 ..... 7.20
Munhall,Pa. U5 ..... 7.20
Newport,Ky. A2 ..... 7.20
Pittsburgh J5 ..... 7.20
Seattle B3 ..... 8.10
Sharon,Pa. S3 ..... 7.20
S.Chicago,Ill. U5, W14 .. 7.20
SparrowsPoint,Md. B2 .. 7.20
Youngstown Y1 ..... 7.20

FLOOR PLATES
Cleveland J5 ..... 6.175
Conshohocken,Pa. A3 .. 6.175
Ind.Harbor,Ind. I-2 ... 6.175
Munhall,Pa. U5 ..... 6.175
S.Chicago,Ill. U5 ..... 6.175

PLATES, Ingot Iron
Ashland c.l.(15) A10 .. 5.35
Ashland l.c.l.(15) A10 .. 5.85
Cleveland c.l. R2 ..... 5.85
Warren,O. c.l. R2 ..... 5.85

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ... 5.425
Aliquippa,Pa.(9) J5 ... 5.425
Alton,Ill. L1 ..... 5.625
Atlanta(9) A11 ..... 5.625
Bessemer,Ala.(9) T2 .. 5.425
Birmingham(9) C15 ... 5.425
Buffalo(9) R2 ..... 5.425
Clairton,Pa.(9) U5 .... 5.425
Cleveland(9) R2 ..... 5.425
Ecorse,Mich.(9) G5 .... 5.525
Emeryville,Calif. J7 ... 6.175
Fairfield,Ala.(9) T2 ... 5.425
Fairless,Pa.(9) U5 .... 5.575
Fontana,Calif.(9) K1 .. 6.125
Gary,Ind.(9) U5 ..... 5.425
Houston(9) S5 ..... 5.675
Ind.Harbor(9) I-2, Y1 .. 5.425
Johnstown,Pa.(9) B2 .. 5.425
Joliet,Ill. P22 ..... 5.425
KansasCity,Mo.(9) S5 .. 5.675
Lackawanna(9) B2 ..... 5.425
LosAngeles(9) B3 ..... 6.125
Midland,Pa.(23) C18 ... 5.725
Milton,Pa. M18 ..... 5.575
Minnequa,Colo. C10 .... 5.875
Niles,Calif. P1 ..... 6.125
N.Tonawanda,N.Y.(23)B11 5.775
Owensboro,Ky.(9) G8 .. 5.425
Pittsburg,Calif.(9) C11 . 6.125
Pittsburgh(9) J5 ..... 5.425
Portland,Oreg. O4 .... 6.175
Seattle B3, N14 ..... 6.175
S.Ch'c'go(9)R2,U5,W14 5.425
S.Duquesne,Pa.(9) U5 .. 5.425
S.SanFran.,Calif.(9)B3 6.175
Sterling,Ill.(1)(9) N15 . 5.425
Sterling,Ill.(9) N15 ... 5.525
Struthers,O.(9) Y1 .... 5.425
Tonawanda,N.Y. B12 .... 5.425
Torrance,Calif.(9) C11 . 6.125
Youngstown(9)R2, U5 .. 5.425

BARS, H.R. Leaded Alloy (Including leaded extra)
Warren,O. C17 ..... 7.475

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 ..... 6.475
Bethlehem,Pa. B2 ..... 6.475
Bridgeport,Conn. C32 ... 6.55
Buffalo R2 ..... 6.475
Canton,O. R2, T7 ..... 6.475
Clairton,Pa. U5 ..... 6.475
Detroit S41 ..... 6.475
Economy,Pa. B14 ..... 6.475
Ecorse,Mich. G5 ..... 6.575
Fairless,Pa. U5 ..... 6.625
Farrell,Pa. S3 ..... 6.475
Fontana,Calif. K1 ..... 7.525
Gary,Ind. U5 ..... 6.475
Houston S5 ..... 6.725
Ind.Harbor,Ind. I-2, Y1. 6.475
Johnstown,Pa. B2 ..... 6.475
KansasCity,Mo. S5 .... 6.725
Lackawanna,N.Y. B2 .. 6.475
Lowellville,O. S3 ..... 6.475
LosAngeles B3 ..... 7.525
Massillon,O. R2 ..... 6.475
Midland,Pa. C18 ..... 6.475
Owensboro,Ky. G8 ..... 6.475
Pittsburgh J5 ..... 6.475
Sharon,Pa. S3 ..... 6.475
S.Chicago R2, U5, W14 6.475
S.Duquesne,Pa. U5 .... 6.475
Struthers,O. Y1 ..... 6.475
Warren,O. C17 ..... 6.475
Youngstown U5 ..... 6.475

BARS & SMALL SHAPES, H.R. High-Strength, Low-Alloy
Aliquippa,Pa. J5 ..... 7.925
Bessemer,Ala. T2 ..... 7.925
Bethlehem,Pa. B2 ..... 7.925
Clairton,Pa. U5 ..... 7.925
Cleveland R2 ..... 7.925
Ecorse,Mich. G5 ..... 8.025
Fairfield,Ala. T2 ..... 7.925
Fontana,Calif. K1 .... 8.625
Gary,Ind. U5 ..... 7.925
Houston S5 ..... 8.175
Ind.Harbor,Ind. Y1 .... 7.925
Johnstown,Pa. B2 ..... 7.925
KansasCity,Mo. S5 .... 8.175
Lackawanna,N.Y. B2 .. 7.925
LosAngeles B3 ..... 8.625
Pittsburgh J5 ..... 7.925
Seattle B3 ..... 8.675
S.Chicago,Ill. U5, W14 . 7.925
S.Duquesne,Pa. U5 .... 7.925
S.SanFrancisco B3 .... 8.675
Struthers,O. Y1 ..... 7.925
Youngstown U5 ..... 7.925

BAR SIZE ANGLES; H.R. Carbon
Bethlehem,Pa.(9) B2 ... 5.575
Houston(9) S5 ..... 5.675
KansasCity,Mo.(9) S5 .. 5.675
Lackawanna(9) B2 ..... 5.425
Sterling,Ill. N15 ..... 5.525
Sterling,Ill.(1) N15 ... 5.425
Tonawanda,N.Y. B12 .... 5.425

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 ..... 5.425
Atlanta A11 ..... 5.625
Joliet,Ill. P22 ..... 5.425
Niles,Calif. P1 ..... 6.125
Pittsburgh J5 ..... 5.425
Portland,Oreg. O4 .... 6.175
SanFrancisco S7 ..... 6.275
Seattle B3 ..... 6.175

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 ..... 6.55
Clairton,Pa. U5 ..... 6.55
Gary,Ind. U5 ..... 6.55
Houston S5 ..... 6.80
KansasCity,Mo. S5 ..... 6.80
Pittsburgh J5 ..... 6.55
Youngstown U5 ..... 6.55

BARS, C.F., Leaded Alloy (Including leaded extra)
Ambridge,Pa. W18 .... 9.925
BeaverFalls,Pa. M12.. 9.925
Camden,N.J. P13 ..... 10.10
Chicago W18 ..... 9.925
Cleveland C20 ..... 9.925*
Elyria,O. W8 ..... 9.925
LosAngeles P2, S30 .. 11.40*
Monaca,Pa. S17 ..... 9.925
Newark,N.J. W18 .... 10.10
SpringCity,Pa. K3 .... 10.10
Warren,O. C17 ..... 9.925

*Grade A; add 0.50c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ..... 7.30
BeaverFalls,Pa. M12,R2 7.30
Birmingham C15 ..... 7.90
Buffalo B5 ..... 7.35
Camden,N.J. P13 ..... 7.75
Carnegie,Pa. C12 ..... 7.30
Chicago W18 ..... 7.30
Cleveland A7, C20 ..... 7.30
Detroit B5, P17 ..... 7.50
Detroit S41 ..... 7.30
Donora,Pa. A7 ..... 7.30
Elyria,O. W8 ..... 7.30
FranklinPark,Ill. N5 ... 7.30
Gary,Ind. R2 ..... 7.30
GreenBay,Wis. F7 ..... 7.30
Hammond,Ind. J5, L2 .. 7.30
Hartford,Conn. R2 ..... 7.80
Harvey,Ill. B5 ..... 7.30
LosAngeles(49) S30 .... 8.75
LosAngeles P2, R2 .... 8.75
Mansfield,Mass. B5 .... 7.85
Massillon,O. R2, R8 .... 7.30
Midland,Pa. C18 ..... 7.30
Monaca,Pa. S17 ..... 7.30
Newark,N.J. W18 ..... 7.75
NewCastle,Pa.(17) B4 .. 7.30
Pittsburgh J5 ..... 7.30
Plymouth,Mich. P5 ..... 7.55
Putnam,Conn. W18 .... 7.85
Readville,Mass. C14 .... 7.85
S.Chicago,Ill. W14 .... 7.30
SpringCity,Pa. K3 ..... 7.75
Struthers,O. Y1 ..... 7.30
Warren,O. C17 ..... 7.30
Willimantic,Conn. J5 ... 7.80
Waukegan,Ill. A7 ..... 7.30
Youngstown F3, Y1 .... 7.30

BARS, Cold-Finished Carbon (Turned and Ground)
Cumberland,Md.(5) C19 . 6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 .... 8.775
BeaverFalls,Pa. M12.R2 8.775
Bethlehem,Pa. B2 .... 8.775
Bridgeport,Conn. C32 .. 8.925
Buffalo B5 ..... 8.775
Camden,N.J. P13 ..... 8.95
Canton,O. T7 ..... 8.775
Carnegie,Pa. C12 ..... 8.775
Chicago W18 ..... 8.775
Cleveland A7, C20 .... 8.775
Detroit B5, P17 ..... 8.975
Detroit S41 ..... 8.775
Donora,Pa. A7 ..... 8.775
Elyria,O. W8 ..... 8.775
FranklinPark,Ill. N5 ... 8.775
Gary,Ind. R2 ..... 8.775
GreenBay,Wis. F7 ..... 8.775
Hammond,Ind. J5, L2 .. 8.775
Hartford,Conn. R2 ..... 9.075
Harvey,Ill. B5 ..... 8.775
Lackawanna,N.Y. B2 .. 8.775
LosAngeles P2, S30 ... 10.75
Mansfield,Mass. B5 .... 9.075
Massillon,O. R2, R8 .... 8.775
Midland,Pa. C18 ..... 8.775
Monaca,Pa. S17 ..... 8.775
Newark,N.J. W18 ..... 8.95
Plymouth,Mich. P5 ..... 8.975
S.Chicago,Ill. W14 .... 8.775
SpringCity,Pa. K3 ..... 8.95
Struthers,O. Y1 ..... 8.775
Warren,O. C17 ..... 8.775
Waukegan,Ill. A7 ..... 8.775
Willimantic,Conn. J5 .. 9.075
Worcester,Mass. A7 .... 9.075
Youngstown F3, Y1 .... 8.775

BARS, Reinforcing (To Fabricators)

AlabamaCity,Ala. R2 ..5.425
Atlanta A11 .....5.425
Birmingham C15 .....5.425
Buffalo R2 .....5.425
Cleveland R2 .....5.425
Ecorse,Mich. G5 .....5.775
Emeryville,Calif. J7 ..6.175
Fairfield,Ala. T2 .....5.425
Fairless,Pa. U5 .....5.575
Fontana,Calif. K1 .....6.125
Ft.Worth,Tex.(4)(26)T4 5.875
Gary,Ind. U5 .....5.425
Houston S5 .....5.675
Ind.Harbor,Ind. I-2, Y1 5.425
Johnstown,Pa. B2 .....5.425
Joliet,Ill. P22 .....5.425
KansasCity,Mo. S5 ...5.675
Kokomo,Ind. C16 ...5.525
Lackawanna,N.Y. B2..5.425
LosAngeles B3 .....6.125
Milton,Pa M18 .....5.575
Minnequa,Colo. C10 ..5.875
Niles,Calif. P1 .....6.125
Pittsburg,Calif. C11 ..6.125
Pittsburgh J5 .....5.425
Portland,Oreg. O1 .....6.175
SandSprings,Okla. S5 ..5.925
Seattle B3, N14 .....6.175
S.Chicago,Ill. R2 .....5.425
S.Duquesne,Pa. U5 ....5.425
S.SanFrancisco B3 ....6.175
SparrowsPoint,Md. B2..5.425
Sterling,Ill.(1) N15 ..5.425
Sterling,Ill. N15 .....5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ..6.00
Torrance,Calif. C11 ..6.125
Youngstown R2, U5 ..5.425

BARS, Reinforcing (Fabricated; to Consumers)

Boston B2, U8 .....7.65
Chicago U8 .....6.91
Cleveland U8 .....6.89
Houston S5 .....7.35
Johnstown,Pa. B2 .....7.08
KansasCity,Mo. S5 ....7.35
Lackawanna,N.Y. B2 ..6.85
Marion,O. P11 .....6.70
Newark,N.J. U8 .....7.55
Philadelphia U8 .....7.38
Pittsburgh J5, U8 .....7.10
SandSprings,Okla. S5 ..7.60
Seattle B3, N14 .....7.70
SparrowsPt.,Md. B2 ...7.08
St.Paul U8 .....7.92
Williamsport,Pa. S19 ..7.00

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.45
Economy,Pa.(D.R.)B14 18.00
Economy,(Staybolt)B14 18.45

RAIL STEEL BARS

ChicagoIlts.(3) C2, I-2 5.325
ChicagoIlts.(4)(44) I-2 5.425
ChicagoIlts.(4) C2 ...5.425
Franklin,Pa. (3) F5 ..5.325
Franklin,Pa. (4) F5 ..5.425
JerseyShore,Pa.(3) J8 ..5.30
Marion,O. (3) P11 ...5.325
Tonawanda(3) B12 ...5.325
Tonawanda(4) B12 ....6.00
Williamsport,Pa.(3) S19.5.50

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2 ..4.925
Allenport,Pa. P7 .....4.925
Ashland,Ky.(8) A10 ..4.925
Cleveland J5, R2 .....4.925
Conshohocken,Pa. A3 ..4.975
Detroit(8) M1 .....5.025
Ecorse,Mich. G5 .....5.025
Fairfield,Ala. T2 .....4.925
Fairless,Pa. U5 .....4.975
Fontana,Calif. K1 .....5.675
Gary,Ind. U5 .....4.925
Geneva,Utah C11 .....5.025
GraniteCity,Ill.(8) G4..5.125
Ind.Harbor,Ind. I-2, Y1 4.925
Irvin,Pa. U5 .....4.925
Lackawanna,N.Y. B2 ..4.925
Mansfield,O. E6 .....4.925
Munhall,Pa. U5 .....4.925
Newport,Ky.(8) A2 ..4.925
Niles,O. M21, S3 .....4.925
Pittsburg,Calif. C11 ..5.625
Pittsburgh J5 .....4.925
Portsmouth,O. P12 ....4.925
Riverdale,Ill. A1 .....4.925
Sharon,Pa. S3 .....4.925
S.Chicago,Ill. W14 ....4.925
SparrowsPoint,Md. B2 4.925
Steubenville,O. W10 ..4.925
Warren,O. R2 .....4.925
Weirton,W.Va. W6 ....4.925
Youngstown U5, Y1 ..4.925

SHEETS, H.R.(19) Ga. & Lighter

Niles,O. M21 .....6.05

SHEETS, H.R. Alloy

Gary,Ind. U5 .....8.10
Ind.Harbor,Ind. Y1 ....8.10
Irvin,Pa. U5 .....8.10
Munhall,Pa. U5 .....8.10
Newport,Ky. A2 .....8.10
Youngstown U5, Y1 ...8.10

SHEETS, H.R.(14 Ga. & Heavier) High-Strength, Low-Alloy

Cleveland J5, R2 .....7.275
Conshohocken,Pa. A3 ..7.325
Ecorse,Mich. G5 .....7.375
Fairfield,Ala. T2 .....7.275
Fairless,Pa. U5 .....7.325
Farrell,Pa. S3 .....7.275
Fontana,Calif. K1 ....8.025
Gary,Ind. U5 .....7.275
Ind.Harbor,Ind. I-2, Y1 7.275
Irvin,Pa. U5 .....7.275
Lackawanna (35) B2 ..7.275
Munhall,Pa. U5 .....7.275
Pittsburgh J5 .....7.275
S.Chicago,Ill. U5, W14 7.275
Sharon,Pa. S3 .....7.275
SparrowsPoint(36) B2 ..7.275
Warren,O. R2 .....7.275
Weirton,W.Va. W6 ....7.275
Youngstown U5, Y1 ..7.275

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..5.175
Cleveland R2 .....5.675
Warren,O. R2 .....5.675

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....6.80
Middletown,O. A10 ....6.55
Warren,O. R2 .....6.80

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 ..6.05
Allenport,Pa. P7 .....6.05
Cleveland J5, R2 .....6.05
Conshohocken,Pa. A3 ..6.10
Detroit M1 .....6.05
Ecorse,Mich. G5 .....6.15
Fairfield,Ala. T2 .....6.05
Fairless,Pa. U5 .....6.10
Follansbee,W.Va. F4 ..6.05
Fontana,Calif. K1 .....7.30
Gary,Ind. U5 .....6.05
GraniteCity,Ill. G4 ....6.25
Ind.Harbor,Ind. I-2, Y1 6.05
Irvin,Pa. U5 .....6.05
Lackawanna,N.Y. B2 ..6.05
Mansfield,O. E6 .....6.05
Middletown,O. A10 ....6.05
Newport,Ky. A2 .....6.05
Pittsburg,Calif. C11 ....7.00
Pittsburgh J5 .....6.05
Portsmouth,O. P12 ....6.05
SparrowsPoint,Md. B2 ..6.05
Steubenville,O. W10 ...6.05
Warren,O. R2 .....6.05
Weirton,W.Va. W6 ....6.05
Yorkville,O. W10 .....6.05
Youngstown Y1 .....6.05

SHEETS, Cold-Rolled, High-Strength, Low Alloy

Cleveland J5, R2 ....8.975
Ecorse,Mich. G5 .....9.075
Fairless,Pa. U5 .....9.025
Fontana,Calif. K1 ..10.275
Gary,Ind. U5 .....8.975
IndianaHarbor,Ind. Y1 8.975
Irvin,Pa. U5 .....8.975
Lackawanna(37) B2 ..8.975
Pittsburgh J5 .....8.975
SparrowsPoint (38) B2 8.975
Warren,O. R2 .....8.975
Weirton,W.Va. W6 ....8.975
Youngstown Y1 .....8.975

SHEETS, Culvert

	Cu Steel	Cu Fe
Ashland,Ky. A10	.6.95	7.20
Canton,O. R2	....6.95	7.45
Fairfield T2	.....6.95	7.20
Gary,Ind. U5	....6.95	7.20
GraniteCity,Ill. G4	7.15	...
Ind.Harbor I-2	..6.95	7.20
Irvin,Pa. U5	....6.95	7.20
Kokomo,Ind. C16	7.05	...
MartinsFry. W10	.6.95	7.20
Pitts.,Calif. C11	..7.70	...
Pittsburgh J5	....6.95	...
SparrowsPt. B2	..6.95	...

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ...7.20

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2 ..6.60‡
Ashland,Ky. A10 .....6.60‡
Canton,O. R2 .....6.60‡
Dover,O. E6 .....6.60‡
Fairfield,Ala. T2 ....6.60‡
Gary,Ind. U5 .....6.60‡
GraniteCity,Ill. G4 ....6.80*
Ind.Harbor,Ind. I-2 ...6.60‡
Irvin,Pa. U5 .....6.60‡
Kokomo,Ind. C16 .....6.70‡
MartinsFerry,O. W10 ..6.60*
Middletown,O. A10 ....6.60‡
Pittsburg,Calif. C11 ....7.35*
Pittsburgh J5 .....6.60‡
SparrowsPt.,Md. B2 ...6.60‡
Warren,O. R2 .....6.60‡
Weirton,W.Va. W6 ....6.60*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.175

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....9.725
SparrowsPt.(39) B2 ..9.725

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.00
Irvin,Pa. U5 .....7.00

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....6.85
Middletown,O. A10 ....6.85

SHEETS, Electrogalvanized

Cleveland (28) R2 ....7.425
Niles,O. (28) R2 .....7.425
Youngstown J5 .....7.275
Weirton,W.Va. W6 ...7.275

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) .9.25
Butler,Pa. A10 (type 2) .9.35

SHEETS, Enameling Iron

Ashland,Ky. A10 ...†6.625
Cleveland R2 .....6.625
Fairfield,Ala. T2 ....6.625
Gary,Ind. U5 .....6.625
GraniteCity,Ill. G4 ....6.825
Ind.Harbor,Ind. I-2, Y1 6.625
Irvin,Pa. U5 .....6.625
Middletown,O. A10 ....6.625
Niles,O. M21, S3 ....6.625
Youngstown Y1 .....6.625

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ..8.65
Ind.Harbor,Ind. I-2 ..8.475
Yorkville,O. W10 .....8.475

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va.W10 7.00
Gary,Ind. U5 .....7.00
Mansfield,O. E6 .....7.00
Middletown,O. A10 ....7.00
Niles,O. M21, R2, S3 ..7.00
Weirton,W.Va. W6 ....7.00

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.40

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div., H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D3 Dearborn Div., Sharon Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas & Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine & Special Wire
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W. Co.
N20 Neville Ferro Alloy Co.

O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div. Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless Steel Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.925
Allenport,Pa. P7	4.925
Alton,Ill. L1	5.125
Ashland,Ky.(8) A10	4.925
Atlanta A11	4.925
Bessemer,Ala. T2	4.925
Birmingham C15	4.925
Buffalo(27) R2	4.925
Conshohocken,Pa. A3	4.975
Detroit M1	5.025
Ecorse,Mich. G5	5.025
Fairfield,Ala. T2	4.925
Fontana,Calif. K1	5.675
Gary,Ind. U5	4.925
Ind.Harbor,Ind. I-2, Y1	4.925
Johnstown,Pa.(25) B2	4.925
Lackaw'na,N.Y.(25) B2	4.925
LosAngeles(25) B3	5.675
Minnequa,Colo. C10	6.025
Riverdale,Ill. A1	4.925
SanFrancisco S7	6.35
Seattle(25) B3	5.925
Seattle N14	6.35
Sharon,Pa. S3	4.925
S.Chicago W14	4.925
S.SanFrancisco(25) B3	5.675
SparrowsPoint,Md. B2	4.925
Sterling,Ill.(1) N15	4.925
Sterling,Ill. N15	5.025
Torrance,Calif. C11	5.675
Warren,O. R2	4.925
Weirton,W.Va. W6	4.925
Youngstown U5	4.925

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	8.10
Farrell,Pa. S3	8.10
Gary,Ind. U5	8.10
Houston S5	8.35
Ind.Harbor,Ind. Y1	8.10
KansasCity,Mo. S5	8.35
LosAngeles B3	9.30
Lowellville,O. S3	8.10
Newport,Ky. A2	8.10
Sharon,Pa. A2, S3	8.10
S.Chicago,Ill. W14	8.10
Youngstown U5, Y1	8.10

STRIP, Hot-Rolled High-Strength, Low-Alloy

Bessemer,Ala. T2	7.325
Conshohocken,Pa. A3	7.325
Ecorse,Mich. G5	7.425
Fairfield,Ala. T2	7.325
Farrell,Pa. S3	7.325
Gary,Ind. U5	7.325
Ind.Harbor,Ind. I-2, Y1	7.325
Lackawanna,N.Y. B2	7.325
LosAngeles(25) B3	8.075
Seattle(25) B3	8.325
Sharon,Pa. S3	7.325
S.Chicago,Ill. W14	7.325
S.SanFrancisco(25) B3	8.075
SparrowsPoint,Md. B2	7.325
Warren,O. R2	7.325
Weirton,W.Va. W6	7.325
Youngstown U5, Y1	7.325

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5.175
Warren,O. R2	5.675

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	7.15
Baltimore T6	7.15
Boston T6	7.70
Buffalo S40	7.15
Cleveland A7, J5	7.15
Conshohocken,Pa. A3	7.20
Dearborn,Mich. D3	7.25
Detroit D2, M1, P20	7.25
Dover,O. G6	7.15
Ecorse,Mich. G5	7.25
Evanston,Ill. M22	7.25
Follansbee,W.Va. F4	7.15
Fontana,Calif. K1	9.00
FranklinPark,Ill. T6	7.25
Ind.Harbor,Ind. Y1	7.15
Indianapolis J5	7.30
LosAngeles J5	9.05
LosAngeles C1	9.20
NewBedford,Mass. R10	7.60
NewBritain(10) S15	7.15
NewCastle,Pa. B4, E5	7.15
NewHaven,Conn. D2	7.60
NewKensington,Pa. A6	7.15
Pawtucket,R.I. R3	7.80
Pawtucket,R.I. N8	7.70
Philadelphia P24	7.70
Pittsburgh J5	7.15
Riverdale,Ill. A1	7.25
Rome,N.Y.(32) R6	7.15
Sharon,Pa. S3	7.15
Trenton,N.J.(31) R5	8.60
Wallingford,Conn. W2	7.60
Warren,O. R2, T5	7.15
Weirton,W.Va. W6	7.15
Worcester,Mass. A7	7.70
Youngstown J5, Y1	7.15

STRIP, Cold-Rolled Alloy

Boston T6	15.40
Carnegie,Pa. S18	15.05
Cleveland A7	15.05
Dover,O. G6	15.05
Farrell,Pa. S3	15.05
FranklinPark,Ill. T6	15.05
Harrison,N.J. C18	15.05
Indianapolis J5	15.20
Lowellville,O. S3	15.05
Pawtucket,R.I. N8	15.40
Riverdale,Ill. A1	15.05
Sharon,Pa. S3	15.05
Worcester,Mass. A7	15.35
Youngstown J5	15.05

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.45
Dearborn,Mich. D3	10.60
Dover,O. G6	10.45
Ecorse,Mich. G5	10.60
Farrell,Pa. S3	10.50
Ind.Harbor,Ind. Y1	10.65
Sharon,Pa. S3	10.50
Warren,O. R2	10.45
Weirton,W.Va. W6	10.50
Youngstown Y1	10.65

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	7.90

STRIP, C.R. Electrogalvanized

Cleveland A7	7.15*
Dover,O. G6	7.15*
Evanston,Ill. M22	7.25*
Riverdale,Ill. A1	7.25*
Warren,O. B9, T5	7.15*
Worcester,Mass. A7	7.70*
Youngstown J5	7.15*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon,Pa. S3	7.275

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Riverdale,Ill. A1	5.50
Sharon,Pa. S3	5.35
Youngstown U5	5.35

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. D3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	....	....	12.90	16.10	19.30
Indianapolis J5	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles J5	11.15	12.60	14.80	....	....
NewBritain,Conn.(10) S15	8.95	10.40	12.60	15.60	18.55
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	8.95	10.40	12.60	15.60	....
New York W3	...	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	...	10.70	12.90	16.10	19.30
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown J5	8.95	10.40	12.60	15.60	18.55

Spring Steel (Tempered)			Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	...	...	18.10	21.95	26.30
Buffalo W12	...	...	18.10	....	....
Fostoria,O. S1	...	...	18.30	22.15	....
FranklinPark,Ill. T6	...	...	18.45	22.30	26.65
Harrison,N.J. C18	...	...	18.10	21.95	26.30
New York W3	...	...	18.10	21.95	26.30
Palmer,Mass. W12	...	...	18.10	....	....
Trenton,N.J. R5	...	...	18.10	21.95	26.30
Worcester,Mass. A7, T6	...	...	18.10	21.95	26.30
Youngstown J5	...	...	18.45	22.30	26.65

SILICON STEEL

H.R. SHEETS(22 Ga., cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	....	11.80	12.90	13.95
Mansfield,O. E6	9.625	11.10	11.80	12.90	13.95
Newport,Ky. A2	9.625	11.10	11.80	12.90	13.95
Niles,O. M21, S3	9.625	11.10	11.80	12.90	....
Vandergrift,Pa. U5	....	11.10	11.80	12.90	13.95
Warren,O. R2	9.625	11.10	11.80	12.90	....
Zanesville,O. A10	....	11.10	11.80	12.90	13.95

C.R. COILS & CUT LENGTHS (22 Ga.) Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.35	12.05	13.15	14.20
Brackenridge,Pa. A4	....	....	12.05	13.15	14.20
GraniteCity,Ill. G4	9.825*	11.05*	11.75*	12.85*	....
IndianaHarbor,Ind. I-2	9.625†	10.85*	11.55*	12.65*	....
Mansfield,O. E6	9.625*	11.35	12.05	13.15	14.20
Vandergrift,Pa. U5	9.625*	11.35	12.05	13.15	14.20
Warren,O. R2	9.625*	11.35	12.05	13.15	14.20
Zanesville,O. A10	....	11.35†	12.05	13.15	14.20
					Stator
Vandergrift,Pa. U5	....	....	....	....	7.85

H.R. SHEETS (22 Ga., cut lengths)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.00	15.55	16.05	17.10
Vandergrift,Pa. U5	15.00	15.55	16.05	17.10
Zanesville,O. A10	15.00	15.55	16.05	17.10

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	17.60	19.20	19.70	20.20	15.25††
Butler,Pa. A10	....	....	19.20	19.70	20.20	....
Vandergrift,Pa. U5	16.60	17.60	19.20	19.70	20.20	15.25**
Warren,O. R2	....	....	....	....	....	15.25‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. **Cut lengths, ¾-cent lower. ††Coils only.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$8.75	$9.00	$9.40
Fairfield,Ala. T2	8.85	9.10	9.50
Fairless,Pa. U5	8.85	9.10	9.50
Fontana,Calif. K1	9.50	9.75	10.15
Gary,Ind. U5	8.75	9.00	9.40
GraniteCity,Ill. G4	8.85	9.10	9.50
IndianaHarbor,Ind. I-2, Y1	8.75	9.00	9.40
Irvin,Pa. U5	8.75	9.00	9.40
Niles,O. R2	8.75	9.00	9.40
Pittsburg,Calif. C11	9.50	9.75	10.15
SparrowsPoint,Md. B2	8.85	9.10	9.50
Weirton,W.Va. W6	8.75	9.00	9.40
Yorkville,O. W10	8.75	9.00	9.40

ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	7.725	7.925	....
Niles,O. R2	7.725	7.925	8.125

TIN PLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa.J5	$10.05	$10.30
Fairfield,Ala. T2	10.15	10.40
Fairless,Pa. U5	10.15	10.40
Fontana,Calif.K1	10.80	11.05
Gary,Ind. U5	10.05	10.30
Ind.Harb. Y1	10.05	10.30
Pitts.,Calif. C11	10.80	11.05
Sp.Pt.,Md. B2	10.15	10.40
Weirton,W.Va.W6	10.05	10.30
Yorkville,O. W10	10.05	10.30

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$7.85
Fairfield,Ala. T2	7.95
Fairless,Pa. U5	7.95
Fontana,Calif. K1	8.60
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. I-2, Y1	7.85
Irvin,Pa. U5	7.85
Niles,O. R2	7.85
Pittsburg,Calif. C11	8.60
SparrowsPoint,Md. B2	7.95
Weirton,W.Va. W6	7.85
Yorkville,O. W10	7.85

HOLLOWARE ENAMELING Black Plate (29 Gage)

Aliquippa,Pa. J5	$7.50
Gary,Ind. U5	7.50
GraniteCity,Ill. G4	7.60
Ind.Harbor,Ind. Y1	7.50
Irvin,Pa. U5	7.50
Yorkville,O. W10	7.50

MANUFACTURING TERNES (Special Coated, Base Box)

Gary,Ind. U5	$9.70
Irvin,Pa. U5	9.70

ROOFING SHORT TERNES (8 lb Coated, Base Box)

Gary,Ind. U5	$11.25

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	7.65
Aliquippa,Pa. J5	7.65
Alton,Ill. L1	7.85
Atlanta A11	7.65
Bartonville,Ill. K4	7.75
Buffalo W12	7.65
Chicago W13	7.65
Cleveland A7, C20	7.65
Crawfordsville,Ind. M8	7.75
Donora,Pa. A7	7.65
Duluth A7	7.65
Fairfield,Ala. T2	7.65
Fostoria,O.(24) S1	7.75
Houston S5	7.90
Jacksonville,Fla. M8	8.00
Johnstown,Pa. B2	7.65
Joliet,Ill. A7	7.65
KansasCity,Mo. S5	7.90
Kokomo,Ind. C16	7.75
LosAngeles B3	8.60
Minnequa,Colo. C10	7.90
Monessen,Pa. P7, P16	7.65
N.Tonawanda,N.Y. B11	7.65
Palmer,Mass. W12	7.95
Pittsburg,Calif. C11	8.60
Portsmouth,O. P12	7.65
Rankin,Pa. A7	7.65
S.Chicago,Ill. R2	7.65
S.SanFrancisco C10	8.60
SparrowsPoint,Md. B2	7.75
Sterling,Ill.(1) N15	7.65
Sterling,Ill. N15	7.75
Struthers,O. Y1	7.65
Waukegan,Ill. A7	7.65
Worcester,Mass. A7	7.95

WIRE, Gal'd ACSR for Cores

Bartonville,Ill. K4	12.65
Buffalo W12	12.65
Cleveland A7	12.65
Donora,Pa. A7	12.65
Duluth A7	12.65
Johnstown,Pa. B2	12.65
Minnequa,Colo. C10	12.775
Monessen,Pa. P7, P16	12.65
Muncie,Ind. I-7	12.85
NewHaven,Conn. A7	12.95
Palmer,Mass. W12	12.95
Pittsburg,Calif. C11	13.45
Portsmouth,O. P12	12.65
Roebling,N.J. R5	12.95
SparrowsPt.,Md. B2	12.75
Struthers,O. Y1	12.65
Trenton,N.J. A7	12.95
Waukegan,Ill. A7	12.65
Worcester,Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.30
Alton,Ill. L1	9.50
Buffalo W12	9.30
Cleveland A7	9.30
Donora,Pa. A7	9.30
Duluth A7	9.30
Johnstown,Pa. B2	9.30
KansasCity,Mo. S5	9.55
LosAngeles B3	10.25
Minnequa,Colo. C10	9.50
Monessen,Pa. P7, P16	9.30
NewHaven,Conn. A7	9.60
Palmer,Mass. W12	9.60
Pittsburg,Calif. C11	10.25
Portsmouth,O. P12	9.30
Roebling,N.J. R5	9.60
S.Chicago,Ill. R2	9.30
S.SanFrancisco C10	10.25
SparrowsPt.,Md. B2	9.40
Struthers,O. Y1	9.30
Trenton,N.J. A7	9.60
Waukegan,Ill. A7	9.30
Worcester,Mass. A7	9.60

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5	9.30
Alton,Ill. L1	9.50
Bartonville,Ill. K4	9.40
Buffalo W12	9.30
Cleveland A7	9.30
Donora,Pa. A7	9.30
Duluth A7	9.30
Fostoria,O. S1	9.35
Johnstown,Pa. B2	9.30
KansasCity,Mo. S5	9.55
LosAngeles B3	10.25
Milbury,Mass.(12) N6	9.60
Minnequa,Colo. C10	9.50
Monessen,Pa. P7, P16	9.30
Muncie,Ind. I-7	9.50
Palmer,Mass.(12) W12	9.60
Pittsburg,Calif. C11	10.25
Portsmouth,O. P12	9.30
Roebling,N.J. R5	9.60
S.Chicago,Ill. R2	9.30
S.SanFrancisco C10	10.25
SparrowsPt.,Md. B2	9.40
Struthers,O. Y1	9.30
Trenton,N.J. A7	9.60
Waukegan,Ill. A7	9.60
Worcester A7, J4, T6	9.60

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	15.80
Bartonville,Ill. K4	15.70
Buffalo W12	15.60
Chicago W13	15.60
Cleveland A7	15.60
CrawfordsvilleInd. M8	15.70
Fostoria,O. S1	15.60
Houston S5	15.85
Jacksonville,Fla. M8	15.95
Johnstown,Pa. B2	15.60
KansasCity,Mo. S5	15.85
Kokomo,Ind. C16	15.60
Minnequa,Colo. C10	15.85
Monessen,Pa. P16	15.60
Muncie,Ind. I-7	15.80
Palmer,Mass. W12	15.90
S.SanFrancisco C10	16.45
Waukegan,Ill. A7	15.60
Worcester,Mass. A7, T6	15.90

ROPE WIRE (A)

Bartonville,Ill. K4	12.75
Buffalo W12	12.75
Fostoria,O. S1	12.75
Johnstown,Pa. B2	12.75
Monessen,Pa. P7	12.75
Muncie,Ind. I-7	12.95
Palmer,Mass. W12	13.05
Portsmouth,O. P12	12.75
Roebling,N.J. R5	13.05
SparrowsPt.,Md. B2	12.85
Struthers,O. Y1	12.75
Worcester,Mass. J4	13.05

(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE, Tire Bead

Bartonville,Ill. K4	16.55
Monessen,Pa. P16	16.55
Roebling,N.J. R5	17.05

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	11.65
Baltimore T6	11.95
Boston T6	11.95
Buffalo W12	11.65
Chicago W13	11.75
Cleveland A7	11.65
Crawfordsville,Ind. M8	11.65
Dover,O. G6	11.65
Fostoria,O. S1	11.65
FranklinPark,Ill. T6	11.75
Kokomo,Ind. C16	11.65
Massillon,O. R8	11.65
Milwaukee C22	11.85
Monessen,Pa. P7, P16	11.65
Palmer,Mass. W12	11.95
Pawtucket,R.I. N8	11.95
Philadelphia P24	11.95
Riverdale,Ill. A1	11.75
Rome,N.Y. R6	11.65
Sharon,Pa. S3	11.65
Trenton,N.J. R5	11.95
Warren,O. B2	11.65
Worcester,Mass. A7, T6	11.95

NAILS, Stock

	Col.
AlabamaCity,Ala. R2	.173
Aliquippa,Pa. J5	.173
Atlanta A11	.175
Bartonville,Ill. K4	.175
Chicago W13	.173
Cleveland A9	.173
Crawfordsville,Ind. M8	.175
Donora,Pa. A7	.173
Duluth A7	.173
Fairfield,Ala. T2	.173
Houston S5	.178
Jacksonville,Fla.(20) M8	.184
Johnstown,Pa. B2	.173
Joliet,Ill. A7	.173
KansasCity,Mo. S5	.178
Kokomo,Ind. C16	.175
Minnequa,Colo. C10	.178
Monessen,Pa. P7	.173
Pittsburg,Calif. C11	.192
Rankin,Pa. A7	.173
S.Chicago,Ill. 92	.173
SparrowsPt.,Md. B2	.175
Sterling,Ill.(7) N15	.175
Worcester,Mass. A7	.179

(To Wholesalers, per cwt)

Galveston,Tex. D7	$9.10

NAILS, Cut (100 lb keg)

To Dealers (33)	
Conshohocken,Pa. A3	$9.80
Wheeling,W.Va. W10	9.80

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	.175
Aliquippa,Pa. J5	.175
Atlanta A11	.177
Bartonville,Ill. K4	.177
Crawfordsville,Ind. M8	.177
Donora,Pa. A7	.175
Duluth A7	.175
Fairfield,Ala. T2	.175
Houston S5	.180
Jacksonville,Fla.(20) M8	186
Johnstown,Pa. B2	.175
Joliet,Ill. A7	.175
KansasCity,Mo. S5	.180
Kokomo,Ind. C16	.177
Minnequa,Colo. C10	.180
Pittsburg,Calif. C11	.194
Rankin,Pa. A7	.175
S.Chicago,Ill. R2	.175
SparrowsPt.,Md. B2	.177
Sterling,Ill.(7) N15	.175
Worcester,Mass. A7	.181

TIE WIRE, Automatic Baler
(14½ Ga.)(Per 97 lb Net Box)
Coil No. 3150

AlabamaCity,Ala. R2	$10.26
Atlanta A11	10.36
Bartonville,Ill. K4	10.36
Buffalo W12	10.26
Chicago W13	10.26
Crawfordsville,Ind. M8	10.36
Donora,Pa. A7	10.26
Duluth A7	10.26
Fairfield,Ala. T2	10.26
Houston S5	10.51
Jacksonville,Fla. M8	10.82
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	10.26
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	10.36
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	11.04
S.Chicago,Ill. R2	10.26
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill.(37) N15	10.36

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$10.60
Atlanta A11	10.70
Bartonville,Ill. K4	10.70
Buffalo W12	10.60
Chicago W13	10.60
Crawfordsville,Ind. M8	10.70
Donora,Pa. A7	10.60
Duluth A7	10.60
Fairfield,Ala. T2	10.60
Houston S5	10.85
Jacksonville,Fla. M8	11.16
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	10.60
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	10.70
Los Angeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	11.40
S.Chicago,Ill. R2	10.60
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill. (37) N15	10.70

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$10.65
Atlanta A11	10.75
Bartonville,Ill. K4	10.75
Buffalo W12	10.65
Chicago W13	10.65
Crawfordsville,Ind. M8	10.75
Donora,Pa. A7	10.65
Duluth A7	10.65
Fairfield,Ala. T2	10.65
Houston S5	10.90
Jacksonville,Fla. M8	11.21
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	10.65
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	10.75
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	11.45
S.Chicago,Ill. R2	10.65
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill.(37) N15	10.75

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	.212
Atlanta A11	.214
Bartonville,Ill. K4	.214
Crawfordsville,Ind. M8	.214
Donora,Pa. A7	.212
Duluth A7	.212
Fairfield,Ala T2	.212
Houston S5	.217
Jacksonville,Fla. M8	.219
Joliet,Ill. A7	.212
KansasCity,Mo. S5	.217
Kokomo,Ind. C16	.214
Minnequa,Colo. C10	.217
Pittsburg,Calif. C11	.236
S.SanFrancisco C10	.236
SparrowsPt.,Md. B2	.214
Sterling,Ill.(7) N15	.214

FENCE POSTS

Birmingham C15	172
ChicagoHts., Ill. C2, I-2	172
Duluth A7	172
Franklin,Pa. F5	172
Huntington,W.Va. C15	172
Johnstown,Pa. B2	172
Marion,O. P11	172
Minnequa,Colo. C10	177
Sterling,Ill.(1) N15	172
Tonawanda,N.Y. B12	174

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198*
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. M8	203
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213**
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198††

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-14½ga.J5	190§
Atlanta A11	192*
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	197
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189†
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192††

	An'ld Galv.	Stone
WIRE (16 gage)		
Ala.City,Ala.R2	17.15	18.70**
Aliq'ppa,Pa. J5	17.15	18.95
Bartonville K4	17.25	19.05
Cleveland A7	17.15	...
Crawf'dsville M8	17.25	19.05
Fostoria,O. S1	17.65	19.20†
Houston S5	17.40	18.95**
Jacksonville M8	17.50	19.30
Johnstown B2	17.15	18.95§
Kan.City,Mo. S5	17.40	...
Kokomo C16	17.25	18.80†
Minnequa C10	17.40	18.95**
P'lm'r,Mass.W12	17.45	19.00†
Pitts.,Calif. C11	17.50	19.05†
SparrowsPt. B2	17.25	19.05§
Sterling(37)N15	17.25	19.05††
Waukegan A7	17.15	18.70†
Worcester A7	17.45	...

WIRE, Merchant Quality
(6 to 8 gage) An'ld Galv.

Ala.City,Ala. R2	8.65 9.20**
Aliquippa J5	8.65 9.325§
Atlanta(48) A11	8.75 9.425*
Bartonville(48) K4	8.75 9.425
Buffalo W12	8.65 9.20†
Cleveland A7	8.65 ...
Crawfordsville M8	8.75 9.425
Donora,Pa. A7	8.65 9.20†
Duluth A7	8.65 9.20†
Fairfield T2	8.65 9.20†
Houston(48) S5	8.90 9.45**
Jacks'ville,Fla. M8	9.00 9.675
Johnstown B2(48)	8.65 9.325§
Joliet,Ill. A7	8.65 9.20†
Kans.City(48) S5	8.90 9.45**
Kokomo C16	8.75 9.30†
LosAngeles B3	9.60 10.275§
Minnequa C10	8.90 9.45**
Monessen P7(48)	8.65 9.325§
Palmer,Mass. W12	8.95 9.50†
Pitts.,Calif. C11	9.60 10.15†
Rankin,Pa. A7	8.65 9.20†
S.Chicago R2	8.65 9.20**
S.SanFran. C10	9.60 10.15**
Spar'wsPt.B2(48)	8.75 9.425§
Sterling(48) N15	8.90 9.575††
Sterling(1) (48)	8.80 9.475††
Struthers,O. Y1	8.65 9.30†
Worcester,Mass.A7	8.95 9.50†

Based on zinc price of: *13.50. †5c. $10c. ‡Less than 10c. ††10.50c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, full container quantity, per cent off list, f.o.b. mill)

BOLTS

Carriage, Machine Bolts
Full Size Body (cut thread)
½ in. and smaller:
6 in. and shorter ... 49.0
Longer than 6 in. ... 39.0
⅝ in. thru 1 in.:
6 in. and shorter ... 39.0
Longer than 6 in. ... 35.0
1⅛ in. and larger:
All lengths ... 35.0
Undersized Body (rolled thread)
½ in. and smaller:
6 in. and shorter ... 49.0
Carriage, Machine, Lag Bolts
Hot Galvanized:
½ in. and smaller:
6 in. and shorter ... 29.0
Longer than 6 in. ... 15.0
⅝ in. and larger:
All lengths ... 12.0
Lag Bolts (all diam.)
6 in. and shorter ... 49.0
Longer than 6 in. ... 39.0
Plow and Tap Bolts
½ in. and smaller by 6 in. and shorter ... 49.0
Larger than ½ in. or longer than 6 in. ... 39.0
Blank Bolts ... 39.0
Step, Elevator, Tire Bolts 49.0
Stove Bolts, Slotted:
⅛ to ¼ in. incl., 3 in. and shorter. 55.0
⅛ to ½ in., inclusive ... 55.0

NUTS

Reg. & Heavy Square Nuts:
All sizes ... 55.5
Square Nuts, Reg. & Heavy, Hot Galvanized:
All sizes ... 41.0
Hex Nuts, Reg. & Heavy, Hot Pressed:
¾ in. and smaller ... 60.5
⅞ in. to 1 in., incl. 55.5
1⅛ in. to 1½ in., incl. ... 58.5
1⅝ in. and larger ... 53.5
Hex Nuts, Reg. & Heavy, Cold Punched:
¾ in. and smaller ... 60.5
⅞ in. to 1½ in., incl. 55.5
1⅝ in. and larger ... 53.5
Hex Nuts, All Types, Hot Galvanized:
¾ in. and smaller ... 46.5
⅞ in. to 1 in., incl. 41.5
1⅛ in. to 1½ in., incl. ... 46.5
Hex Nuts, Semifinished, Heavy (Incl. Slotted):
¾ in. and smaller ... 60.5
⅞ in. to 1½ in., incl. ... 55.5
1⅝ in. and larger ... 53.5
Hex Nuts, Finished (Incl.) Slotted and Castellated):
1 in. and smaller ... 63.0
1⅛ in. to 1½ in., incl. ... 59.0
1⅝ in. and larger ... 53.5

CAP AND SETSCREWS
(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Capscrews, Coarse or Fine Thread, Bright:
6 in. and shorter:
¾ in. and smaller ... 40.0
⅞, 1 in. and 1 in. diam. ... 22.0
Longer than 6 in.:
⅝ in. and smaller ... 8.0
¾, ⅞, and 1 in. diam. ... + 6.0
High Carbon, Heat Treated:
6 in. and shorter:
⅝ in. and smaller ... 26.0
¾, ⅞, and 1 in. diam. ... 3.0
Longer than 6 in.:
⅝ in. and smaller ... + 13.0
¾, ⅞, and 1 in. diam. ... + 32.0
Flat Head Capscrews:
¾ in. and smaller ... + 76.0
Setscrews, Square Head.
Cup Point, Coarse Thread:
Through 1 in. diam.:
6 in. and shorter ... Net
Longer than 6 in. ... + 23

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.
Structural ½ in., larger 12.25
⅞ in. under: List less 19%

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	25.98	23.54
1¼	13	....	30.78	23.36
1½	13	29.03	34.01	25.83
1¾	13	34.29	40.18	30.51
2	13	38.44	45.05	34.20
2¼	13	43.29	50.75	38.52
2¼	12	46.99	55.06	41.81
2½	12	51.76	60.65	46.05
2¾	12	56.04	65.67	49.88
3	12	59.76	70.03	53.19

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
Rails				
Bessemer,Pa. U5	5.525	5.425	....	6.50
Ensley,Ala. T2	5.525	5.425	....	6.50
Fairfield,Ala. T2	....	....	....	6.50
Gary,Ind. U5	5.525	5.425	....	...
Huntington,W.Va. C15	....	....	....	6.50
IndianaHarbor,Ind. I-2	5.525	5.425	5.475	...
Johnstown,Pa. B2	....	....	....	(16)6.50
Lackawanna,N.Y. B2	5.525	5.425	....	6.50
Minnequa,Colo. C10	5.525	5.425	....	7.00
Steelton,Pa. B2	5.525	5.425	....	...
Williamsport,Pa. S19	....	....	....	6.50

TIE PLATES

Fairfield,Ala. T2	6.60
Gary, Ind. U5	6.60
Ind.Harbor,Ind. I-2	6.60
Lackawanna,N.Y. B2	6.60
Minnequa,Colo. C10	6.60
Seattle B3	6.75
Steelton,Pa. B2	6.60
Torrance,Calif. C11	6.75

JOINT BARS

Bessemer,Pa. U5	6.975
Fairfield,Ala. T2	6.975
Ind. Harbor,Ind. I-2	6.975
Joliet,Ill. U5	6.975
Lackawanna,N.Y. B2	6.975
Minnequa,Colo. C10	6.975
Steelton,Pa. B2	6.975

AXLES

Ind.Harbor,Ind. S13	8.775
Johnstown,Pa. B2	8.775

TRACK BOLTS, Untreated

Cleveland R2	14.75
KansasCity,Mo. S5	14.75
Lebanon,Pa. B2	14.75
Minnequa,Colo. C10	14.75
Pittsburgh P14	14.75
Seattle B3	15.25

SCREW SPIKES

Lebanon,Pa. B2	14.50

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.75
Ind.Harbor,Ind. I-2, Y1	9.75
KansasCity,Mo. S5	9.75
Lebanon,Pa. B2	9.75
Minnequa,Colo. C10	9.75
Pittsburgh J5	9.75
Seattle B3	10.25
S.Chicago,Ill. R2	9.75
Struthers,O. Y1	9.75
Youngstown R2	9.75

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) Plus 1c per 100 lb.
(21) New Haven, Conn. base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.15c, finer than 15 Ga.
(25) Bar mill bands.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.60c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.685c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.30c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Ambridge, Pa. N2	+9.25	....	+2.75	....	+0.25	....	1.25	....	1.25	....	1	....	3.5	....
Lorain, O. N3	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Youngstown Y1	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

ELECTRIC STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Alton, Ill. L1	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Benwood, W. Va. W10	4.5	+22	+7.5	+31	+18	+39.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Butler, Pa. F6	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Fairless, Pa. N3	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Fontana, Calif. K1	....	....	....	....	....	....	+8.25	+23.5	+5.25	+19.5	+1.75	+15	0.75	+14.25
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	4.25	+11	7.25	+7	10.75	+2.5	13.25	+3.25
Lorain, O. N3	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sharon, Pa. S4	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sparrows Pt., Md. B2	3.5	+23	+8.5	+32	+19	+40.5	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Wheatland, Pa. W9	5.5	+21	+6	+30	+17	+38.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Youngstown R2, Y1	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.72		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Alton, Ill. L1	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	....	....	....	....
Benwood, W. Va. W10	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Etna, Pa. N2	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Fairless, Pa. N3	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Fontana, Calif. K1	1.25	+13.25	1.75	+12.75	3.25	+13	3.25	+13	+7.25	+24	+7.25	+24
Indiana Harbor, Ind. Y1	13.75	+0.75	14.25	+0.25	15.75	+0.5	15.25	+0.5	5.25	+11.5	5.25	+11.5
Lorain, O. N3	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sharon, Pa. M6	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sparrows Pt., Md. B2	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Wheatland, Pa. W9	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Youngstown R2, Y1	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5

*Galvanized pipe discounts based on current price of zinc (10.00c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.00	27.00	....	36.00	40.00	42.00	44.25	48.50	45.00
202	23.75	30.25	36.50	39.00	40.75	43.00	45.00	49.25	49.25
301	23.25	28.00	37.25	37.25	42.00	44.25	46.25	51.25	47.25
302	25.25	31.50	38.00	40.50	42.75	45.00	47.25	52.00	52.00
302B	25.50	32.75	40.75	45.75	45.00	47.25	49.50	57.00	57.00
303	....	32.00	41.00	46.00	45.50	48.00	50.00	56.75	56.75
304	27.00	33.25	40.50	44.25	45.25	47.75	50.75	55.00	55.00
304L	....	....	48.25	51.50	53.00	55.50	58.50	63.25	62.75
305	28.50	36.75	42.50	47.50	45.25	47.75	51.25	58.75	58.75
308	30.75	38.25	47.25	50.25	52.75	55.75	60.25	63.00	63.00
309	39.75	49.50	57.75	64.50	63.75	67.00	71.00	80.50	80.50
310	49.75	61.50	78.00	84.25	86.50	91.00	92.75	96.75	96.75
314	....	....	77.50	....	86.50	91.00	92.75	99.00	104.25
316	39.75	49.50	62.25	69.25	69.25	73.00	76.75	80.75	80.75
316L	....	55.50	70.00	76.50	77.00	80.75	84.50	89.25	88.50
317	48.00	60.00	76.75	88.25	86.25	90.75	93.50	101.00	101.00
321	32.25	40.00	47.00	53.50	52.50	55.50	59.75	65.50	65.50
330	....	....	106.75	....	95.25	106.75	105.50	108.00	149.25
18-8 CbTa	37.00	46.50	55.75	63.50	61.50	64.75	69.75	79.25	79.25
403	....	....	32.00	....	35.75	37.75	40.25	48.25	48.25
405	19.50	25.50	29.75	36.00	33.50	35.25	37.50	46.75	46.75
410	16.75	21.50	28.25	31.00	32.00	33.75	35.00	40.25	40.25
416	....	....	28.75	....	32.50	34.25	36.00	48.25	48.25
420	26.00	33.50	34.25	41.75	39.25	41.25	45.25	52.00	62.00
430	17.00	21.75	28.75	32.00	32.50	34.25	36.00	40.75	40.75
430F	....	....	29.50	....	33.00	34.75	36.75	51.75	42.00
431	....	28.75	37.75	....	42.00	44.25	46.00	56.00	56.00
446	....	....	39.25	59.00	44.25	46.50	47.75	70.00	70.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless Steel Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steels Inc.; U. S. Steel Corp.; Universal-Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel Co., subsidiary of Allegheny Ludlum Steel Corp.; Washington Steel Corp.

Clad Steel

	Plates 5%	Plates Carbon Base 10%	Plates Carbon Base 15%	Plates Carbon Base 20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	34.70	37.95	42.25	46.70	39.75
304L	36.90	40.55	45.10	49.85	....
316	40.35	44.50	49.50	54.50	58.25
316L	45.05	49.35	54.70	60.10	....
316 Cb	47.30	53.80	61.45	69.10	....
321	36.60	40.05	44.60	49.30	47.25
347	38.25	42.40	47.55	52.80	57.00
405	28.60	29.85	33.35	36.85	....
410	28.15	29.55	33.10	36.70	....
430	28.30	29.80	33.55	37.25	....
Inconel	48.00	59.55	70.15	80.85	....
Nickel	41.65	51.95	62.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....
Copper*	....	....	....	....	46.00

	Strip, Carbon Base —Cold Rolled— 10%	Strip, Carbon Base —Cold Rolled— Both Sides
Copper*	33.10	38.75

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.305	Cr-Hot Work	0.475
Extra Carbon	0.360	W-Cr Hot Work	0.500
Special Carbon	0.475	V-Cr Hot Work	0.520
Oil Hardening	0.0475	Hi-Carbon-Cr	0.925

Grade by Analysis (%) W	Cr	V	Co	Mo		$ per lb
20.25	4.25	1.6	12.25	....	....	4.285
18.25	4.25	1	4.75	....	....	2.500
18	4	2	9	....	....	2.870
18	4	2	....	....	....	1.960
18	4	1	....	....	....	1.795
9	3.5	..	....	....	....	1.395
13.5	4	3	....	....	....	2.060
13.75	3.75	2	5	....	....	2.440
6.4	4.5	1.9	....	5	....	1.300
6	4	3	....	6	....	1.545
1.5	4	1	....	8.5	....	1.155

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal transportation tax.

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Birmingham District				
Birmingham, R2	62.00	62.50‡	....	....
Birmingham, U6	....	62.50‡	66.50	....
Woodward, Ala., W15	62.00**	62.50‡	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo, H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda, N.Y., T9	....	66.50	67.00	67.50
Tonawanda, N.Y., W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester, N.Y., deld.	69.02	69.52	70.02	....
Syracuse, N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago, I-3	66.00	66.50	66.50	67.00
S.Chicago, Ill., R2	66.00	66.50	66.50	67.00
S.Chicago, Ill., W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon, Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland, R2, A7	66.00	66.50	66.50	67.00
Akron, Ohio, deld.	69.12	69.62	69.62	70.12
Mid-Atlantic District				
Birdsboro, Pa., B10	68.00	68.50	69.00	69.50
Chester, Pa., P4	68.00	68.50	69.00	....
Swedeland, Pa., A3	68.00	68.50	69.00	69.50
New York, deld.	....	75.50	76.00	....
Newark, N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy, N.Y., R2	68.00	68.50	69.00	69.50
Pittsburgh District				
Neville Island, Pa., P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKees Rocks, Pa., deld.	....	67.60	67.60	68.13
Lawrenceville, Homestead, Wilmerding, Monaca, Pa., deld.	....	68.26	68.26	68.79
Verona, Trafford, Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge, Pa., deld.	68.60	69.10	69.10	69.63
Midland, Pa., C18	66.00	....	....	....
Youngstown District				
Hubbard, Ohio, Y1	....	....	66.50	....
Sharpsville, Pa., S6	66.00	....	66.50	67.00
Youngstown, Y1	....	....	66.50	67.00
Mansfield, Ohio, deld.	70.90	....	71.40	71.90

	Basic	No. 2 Foundry	Malle-able	Besse-mer
Duluth, I-3	66.00	66.50	66.50	67.00
Erie, Pa., I-3	66.00	66.50	66.50	67.00
Everett, Mass., E1	67.50	68.00	68.50	....
Fontana, Calif., K1	75.00	75.50	....	....
Geneva, Utah, C11	66.00	66.50	....	....
Granite City, Ill., G4	67.90	68.40	68.90	....
Ironton, Utah, C11	66.00	66.50	....	....
Minnequa, Colo., C10	68.00	68.50	69.00	....
Rockwood, Tenn., T3	....	62.50‡	66.50	....
Toledo, Ohio, I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.54	73.04	....	....

**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
‡Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% add $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson, Ohio, I-3, J1	$78.00
Buffalo, H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

Calvert City, Ky., P15	$99.00
Niagara Falls, N.Y., P15	99.00
Keokuk, Iowa, Open-hearth & Fdry., $9 freight allowed, K2	103.50
Keokuk, Iowa, O.H. & Fdry., 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles, Tenn., T3 (Phos. 0.035% max)	$78.50
Rockwood, Tenn., T3 (Phos. 0.035% max)	78.50
Troy, N.Y., R2 (Phos. 0.035% max)	74.00
Philadelphia, deld.	82.67
Cleveland, A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth, I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie, Pa., I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Neville Island, Pa., P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††		Carbon	Floor
Atlanta	8.59§	9.86§	....	....	8.64	9.01	10.68	....	9.05	8.97	10.90
Baltimore	8.28	8.88	9.68	....	8.76	9.06	11.34#	15.18	9.19	8.66	10.14
Birmingham	8.18	9.45	11.07	....	8.23	8.60	10.57	....	8.64	8.56	10.70
Boston	9.38	10.41	11.45	53.50	9.42	9.73	12.90#	15.28	9.63	9.72	11.20
Buffalo	8.40	9.00	10.07	55.98	8.50	8.80	10.90#	15.00	8.90	8.90	10.45
Chattanooga	8.55	9.69	9.65	....	8.40	8.77	10.46	....	8.88	8.80	10.66
Chicago	8.20	9.45	10.10	53.00	8.23	8.60	8.80	14.65	8.64	8.56	9.88
Cincinnati	8.34	9.48	10.10	52.43	8.54	8.92	9.31	14.96	9.18	8.93	10.21
Cleveland	8.18	9.45	10.20	52.33	8.33	8.69	10.80#	14.74	9.01	8.79	10.11
Dallas	7.50	8.80	....	....	7.65	7.60	11.01	....	9.00	9.45	10.70
Denver	9.38	11.75	....	....	9.41	9.78	11.10	....	7.65	8.45	9.70
Detroit	8.43	9.70	10.45	56.50	8.58	8.90	9.15	14.91	9.18	8.91	10.13
Erie, Pa.	8.20	9.45	9.95[10]	....	8.50	8.75	9.05[10]	....	9.00	8.85	10.10
Houston	7.10	8.40	8.45	54.32	7.25	7.20	11.10	13.50	7.25	8.05	9.30
Jackson, Miss.	8.52	9.79	....	....	8.57	8.94	10.68	....	8.97	8.90	10.74
Los Angeles	9.60	9.40	11.70	57.60	8.55	8.70	12.00	....	8.60	8.55	10.70
Memphis, Tenn.	8.55	9.80	....	....	8.60	8.97	11.96#	....	9.01	8.93	10.56
Milwaukee	8.33	9.58	10.23	....	8.36	8.73	9.03	14.78	8.85	8.69	10.01
Moline, Ill.	8.55	9.80	10.45	....	8.58	8.95	9.15	....	8.99	8.91	....
New York	8.87	10.13	10.56	53.08	9.31	9.57	12.76#	15.09	9.35	9.43	10.71
Norfolk, Va.	8.40	....	....	....	9.10	9.10	12.00	....	9.40	8.85	10.35
Philadelphia	8.00	8.90	9.92	52.69	8.70	8.65	11.51#	15.01	8.50	8.75	9.75**
Pittsburgh	8.18	9.45	10.45	52.00	8.33	8.60	10.80#	14.65	8.64	8.56	9.88
Portland, Oreg.	8.50	11.20	11.55	57.38	9.55	8.65	14.50	15.95	8.65	8.30	11.50
Richmond, Va.	8.40	....	10.40	....	9.10	9.00	....	....	9.40	8.85	10.35
St. Louis	8.54	9.79	10.46	....	8.59	8.97	9.41	15.01	9.10	8.93	10.25
St. Paul	8.70	10.04	10.71	....	8.84	9.21	9.66	....	9.38	9.30	10.49
San Francisco	9.35	10.75	11.00	55.10	10.95	9.70	11.34#	16.10	9.50	9.60	12.00
Seattle	9.95	11.15	12.20	57.38	10.00	10.10	14.05	16.35	9.80	9.70	12.10
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	9.95	11.15	12.00	57.38	10.00	10.10	14.05	17.20	9.80	9.70	12.10
Washington	8.88	....	....	....	9.36	9.56	10.94	....	9.79	9.26	10.74

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **⅛ in. and heavier; ††as annealed; ‡over 4 in.; §over 3 in.; #1 in. round C-1018.

Base quantities 2000 to 4999 lb except as noted; cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York, Boston, Seattle, Portland, Oreg., 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Portland, Oreg., 1000 to 9999 lb; [3]—400 to 9999 lb; [8]—1000 to 1999 lb; [9]—2000 to 3999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., $135; Salina, Pa., $140; Niles, Ohio, $138; Cutler, Utah, $165.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $175; Stevens Pottery, Ga., $185; Cutler, Utah, $233.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., $150; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $155; E. Chicago, Ind., Joliet, Rockdale, Ill., $160; Lehigh, Utah, $175; Los Angeles, $180.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $157; Morrisville, Hays, Latrobe, Pa., $160; E. Chicago, Ind., $167; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $140; Philadelphia, $137; Woodbridge, N. J., $135.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000)

50 Per Cent: St. Louis, Mexico, Vandalia, Mo., $235; Danville, Ill., $238; Philadelphia, Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $245.

60 Per Cent: St. Louis, Mexico, Vandalia, Mo., $295; Danville, Ill., $298; Clearfield, Orviston, Snow Shoe, Pa., $305; Philadelphia, $310.

70 Per Cent: St. Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $338; Clearfield, Orviston, Snow Shoe, Pa., $345; Philadelphia, $350.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $46; ⅜ in. grains with fines: Baltimore, $73.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-41; 70%, $36.40; 60%, $33-36.50. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $33-34; Mexican, all rail, duty paid, $25.25-25.75; barge, Brownsville, Tex., $27.25-27.75.

Ores

Lake Superior Iron Ore

(Prices effective for the 1958 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos.	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30, 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

New Jersey, foundry and basic 62-64% concentrates	25.00-27.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	25.00
N. African hematite (spot)	nom.
Brazilian iron ore, 68-69%	27.00

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$11.80-12.00*
Domestic, concentrates f.o.b. milling points	20.00

*Before duty.

Manganese Ore

Mn 46-48%, Indian (export tax included), $135 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; other than Indian, nominal; contracts by negotiation.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian

48% 3:1	$50.00
48% 2.8:1	48.00
48% no ratio	39.00

South African Transvaal

48% no ratio	$37.00
44% no ratio	27.00

Turkish

48% 3:1	$55.00

Domestic

Rail nearest seller

48% 3:1	39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked $1.18

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

55-60%	$2.50-2.60
60-65%	2.60-2.90

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish: Deld. east of Mississippi River, ocean bags 23,000 lb and over	10.50
F.o.b. Riverton or Camden, N. J., west of Mississippi River	9.50
Sponge Iron, Domestic, 98 + % Fe: Deld. east of Mississippi River, 23,000 lb and over	10.50
Electrolytic Iron: Melting stock, 99.9% Fe, irregular fragments of ¼ in. x 1.3 in.	28.00
Annealed, 99.5% Fe	36.50
Unannealed (99 + % Fe)	36.00
Unannealed (99 + % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)	29.00
Carbonyl Iron: 98.1-99.9%, 3 to 20 microns, depending on grade, $63.00 - 290.00 in standard 200-lb containers; all minus 200 mesh.	
Aluminum: Atomized, 500-lb drum, freight allowed Carlots	39.50
Ton lots	41.50
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	30.30-45.70†
Bronze, 5000-lb lots	45.70-49.80†
Copper: Electrolytic	14.75*
Reduced	14.75*
Lead	7.50*
Manganese: Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	74.00
Nickel-Silver, 5000-lb lots	47.80-52.60†
Phosphor Copper, 5000-lb lots	57.80
Copper (atomized) 5000-lb lots	38.30-46.80†
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	81.07
Stainless Steel, 316	81.26
Tin	114.50*
Zinc, 5000-lb lots	17.50-30.70†
Tungsten:	Dollars
Melting grade, 99% 60 to 200 mesh, nominal; 1000 lb and over	3.15
Less than 1000 lb	3.30
Chromium, electrolytic 99.8% Cr min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam.	Length	Per 100 lb
2	24	$60.75
2½	30	39.25
3	40	37.00
4	40	35.00
5⅛	40	34.75
6	60	31.50
7	60	28.25
8, 9, 10	60	28.00
12	72	26.75
14	60	26.75
16	72	25.75
17	60	26.25
18	72	26.25
20	72	25.25
24	84	26.00

CARBON

8	60	13.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.40
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa., furnace	$14.75-15.75
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$28.85
Cincinnati, deld.	31.84
Buffalo, ovens	30.50
Camden, N. J., ovens	29.50
Detroit, ovens	30.50
Pontiac, Mich., deld.	32.45
Saginaw, Mich., deld.	34.03
Erie, Pa., ovens	30.50
Everett, Mass., ovens: New England, deld.	31.55*
Indianapolis, ovens	29.75
Ironton, Ohio, ovens	29.00
Cincinnati, deld.	31.84
Kearny, N. J., ovens	29.75
Milwaukee, ovens	30.50
Neville Island (Pittsburgh), Pa., ovens	29.25
Painesville, Ohio, ovens	30.50
Cleveland, deld.	32.69
Philadelphia, ovens	29.50
St. Louis, ovens	31.50
St. Paul, ovens	29.75
Chicago, deld.	33.29
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Or within $1.85 freight zone from works.

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries.)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$5.53	$5.33	$5.33	$5.73
Bar Size Angles	5.73	5.58	5.58	5.99
Structural Angles	5.73	5.58	5.58	5.99
I-Beams	5.88	5.72	5.72	6.02
Channels	5.88	5.72	5.72	6.02
Plates (basic bessemer)	6.79	6.62	6.62	6.94
Sheets, H.R.	8.25	8.20	8.20	8.50
Sheets, C.R. (drawing quality)	9.00	8.95	8.95	9.25
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.71	25.59	25.59	26.46
Barbed Wire (†)	6.65	6.65	6.65	7.00
Merchant Bars	6.23	6.07	6.07	6.43
Hot-Rolled Bands	7.20	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	6.73	6.73	6.73	7.13
Wire Rods, O.H. Cold Heading Quality No. 5	7.07	7.07	7.07	7.47
Bright Common Wire Nails (§)	8.02	8.02	7.92	8.20

†Per 82 lb, net, reel. §Per 100-lb kegs, 20d nails and heavier.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg	29.50
Industrial xylene	32.00-34.00

Per ton, bulk, ovens

Ammonium sulfate	$32.00-34.00

Cents per pound, producing point

Phenol: Grade 1, 17.50; Grade 2-3, 15.50; Grade 4, 17.50; Grade 5, 16.50; Grade 6, 14.50.

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Neville Island, Pa., 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx.) Base price per net ton; $245, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively. (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-90%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.05% C and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2%). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 34c; 2000 lb to min carload, 36c; 500 lb to 1999 lb, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk 1.50% C grade, 18-20% Si, 12.5c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2% from above prices. For 3% C grade Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4% max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38.43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $200 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk 28.75c per lb of contained Cr; c.l. packed 30.30c, ton lot 32.05c; less ton 33.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Ton lot, add 3.5c; less ton, add 5.2c. Delivered.

Cr 67-71%, carload, lump, bulk, C 0.02% max, 41.00c per lb contained Cr; 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00c; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Ton lot, add 3.4c; less ton lot, add 5.1c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 61-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 30.05c per lb of contained Cr. Packed, c.l. 31.65c, ton 33.45c, less ton 34.95c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload, packed, SM x D, 21.25c, per lb of alloy, ton lot 22.50c; less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" down, 27.50c per lb contained Cr, 14.20c per lb contained Si. 0.75" x down, 28.65c per lb contained Cr, 14.20c per lb contained Si. Delivered.

Chromium Metal Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract, carlot, packed 2" x D plate (about ¾" thick) $1.29 per lb, ton lot $1.31, less ton lot $1.33. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 5% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

25-30% Ferrosilicon: Contract, carload, lump, bulk, 20.0c per lb of contained Si. Packed 21.40c; ton lot 22.50c, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

50% Ferrosilicon: Contract, carload, lump, bulk, 14.20c per lb of contained Si. Packed c.l. 16.70c, ton lot 18.15c, less ton 19.80c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.25c per lb contained silicon. Packed, c.l. 17.25c, ton lot 19.05c; less ton 20.4c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.4c per lb of contained Si. Packed, c.l. 18.30c, ton lot 19.95c, less ton 21.2c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 19.5c per lb of contained Si. Packed, c.l. 21.15c, ton lot 22.55c, less ton 23.6c. Delivered. Spot add 0.25c.

Silicon Metal: (98% min Si, 0.75% max Fe, 0.07% max Ca). C.l. lump, bulk, 22.00c per lb of Si. Packed, c.l. 23.65c, ton lot 24.95c, less ton 25.95c. Add 0.5c for max 0.03% Ca grade. Deduct 0.5c, for max 1% Fe grade analyzing min 99.75% Si; 0.75c for max 1.25% Fe grades analyzing min 96.75% Si. Spot, add 0.25c.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy; ton lot, packed, 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Bortam: (B 1.5-1.9%). Ton lot, 45c per lb; less than ton lot, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carload 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3¾ lb each and containing 2 lb of Cr). Contract, carload, bulk 19.60c per lb of briquet; carload packed in box pallets 19.80c, in bags 20.70c; 3000 lb to c.l. in box pallets 21.00c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 11.5c per lb of briquet; c.l. carload, packed 15c; bags 16c; 3000 lb to c.l. pallets 16.2c; 2000 lb to c.l., bags, 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ¾ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, pallets, 15.3c; bags 16.3c, 3000 lb to c.l., pallets, 16.5c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si). Contract, carload, bulk 7.7c per lb of briquet; packed, pallets, 7.9c; bags 8.9c; 3000 lb to c.l., pallets 9.5c; 2000 lb to c.l., bags 10.5c; less ton 11.4c. Delivered. Spot, add 0.25c. (Small size—weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 7.85c. Packed, pallets 8.05c; bags 9.05c; 3000 lb to c.l., pallets 9.65c; 2000 lb to c.l., bags, 10.65c; less ton 11.55c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.41 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8% max, C 0.4% max). Ton lots 2" x D, $4 per lb of contained Cb; less ton lots, $4.05 (nominal). Delivered.

Ferrotantalum—Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lot 2" x D, $3.80 per lb of contained Cb plus Ta, delivered; less ton lot $3.85 (nominal).

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5.7%, Fe 20% approx). Contract, c.l. packed ½-in. x 12 M 20.00c per lb of alloy, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 19c per lb of alloy, ton lot 20.15c; less ton lot 21.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.1c per lb of alloy; ton lot 19.55c; less ton lot 20.8c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 18.50c. Packed c.l. 19.50c, 2000 lb to c.l. 20.50c, less than 2000 lb 21c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $4 for each 1% of P above or below the base); carload, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $110 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo, in 200-lb container, f.o.b. Langeloth and Washington, Pa. $1.68 in all sizes except powdered which is $1.74.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.39; in bags, $1.38, f.o.b. Langeloth and Washington, Pa.

(*Concluded from Page 142*)

In the Pacific Northwest, fabricators report a fair volume of small tonnages, including highway bridges and general construction. Within 30 days, bids will be invited by Seattle for 3000 tons of shapes for a downtown office building and post office.

About 12,000 tons of tower steel and reinforcing for the 310-mile transmission line from Ft. Peck, Mont., to Bismarck, N. Dak., are reported placed with a midwest fabricator.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

12,000 tons, including extensions and reinforcing, tower steel for 310-mile Ft. Peck-Bismarck power line, reported placed with Anchor Metals Co.; Lipsett Inc., Sioux Falls, S. Dak.; general contractor; Bureau of Reclamation project.

550 tons, high school, Mickley, Pa., to Lehigh Structural Steel Co., Allentown, Pa., through Stoffett & Tollotson, Philadelphia, general contractor; 60 tons of reinforcing bars, Truscon Steel Div., Republic Steel Corp., Philadelphia.

185 tons, state highway bridge, Longmeadow, Mass., to McDermott Steel Specialties Co., New Haven, Conn., through Lane Construction Co., Meriden, Conn., general contractor.

180 tons, high school, Wolcott, Conn., to Leake & Nelson Co., Bridgeport, Conn.; Thomas J. Riordan Co., Norwalk, Conn., general contractor.

100 tons or more, plant addition, Pitney-Bowes Inc., Stamford, Conn., to Leake & Nelson Co., Bridgeport, Conn.; steel placed direct.

STRUCTURAL STEEL PENDING

900 tons, Oregon, two bridges, Snake River; also 300 tons of reinforcing; rebids to be asked soon.

450 tons (225 tons wide flange, 225 tons angles) General Stores Supply, Navy, Philadelphia; bids Apr. 29 and 30.

370 tons, Washington state underpass, Pierce County; general contract to R. L. Martin, Oswego, Oreg., low at $225,695.

REINFORCING BARS . . .

REINFORCING BARS PLACED

300 tons, addition and garage, National Bank of Commerce, Seattle, to Northwest Steel Rolling Mills Inc., Seattle; Cawdrey & Vemo, Seattle, general contractor (previously reported placed with another fabricator).

130 tons, two-span highway bridge, Washington state, Lincoln County, to Northwest Steel Rolling Mills Inc., Seattle; Ruud Construction Co., Spokane, Wash., general contractor at $116,379.

112 tons, Washington state span, Adams County, to Bethlehem Pacific Coast Steel Corp., Seattle; Max J. Kuney, Spokane, Wash., general contractor.

REINFORCING BARS PENDING

325 tons, Linden Brook flood control project, Revere-Malden, Mass.; bids to Metropolitan District Commission, Boston.

250 tons, also lump sum for shapes, Washington state, twin girder bridges, Clark County; bids to Olympia, Wash., May 6.

235 tons, Washington state truss bridge, Grays Harbor County; bids to Olympia, Wash., May 6.

195 tons, Washington state underpass, Pierce County; bids to Olympia, Wash., May 6.

100 tons, Washington state span, Grays Harbor County; general contract to Quigg Bros.-McDonald Inc., Hoquiam, Wash., low at $169,874.

100 tons, Idaho state underpass, Power County; general contract to Cherf Bros. Inc. & Sandkay Construction Co., Ephrata, Wash., low at $1,535,334.

Unstated, Everett, Wash., Herald plant; general contract to George E. Teufel Co., Seattle; subcontracts set for Apr. 30.

Unstated, four ammunition magazines, McChord Air Base, Washington state; bids to U. S. Engineer, Seattle, May 20.

PLATES . . .

PLATES PLACED

1500 tons, or more, liners for Portland's Bull Run water supply expansion; to American Pipe & Construction Co., Portland, Oreg., under subcontract from Green Construction Co., Seattle, general contractor.

PLATES PENDING

Unstated, 20,000 ft of electric welded water pipe and couplings; bids May 6 to Joseph G. Ryan, clerk, Port Townsend, Wash.

PIPE . . .

CAST IRON PIPE PLACED

200 tons, 10 and 6 in., for Pullman, Wash., to unstated Portland, Oreg., interest.

155 tons, 6 and 4 in., for Myrtle, Oreg., to U. S. Pipe & Foundry Co., Portland, Oreg. Portland, Oreg.

CAST IRON PIPE PENDING

Unstated, 73,000 ft of 14 to 4 in.; bids to King County District No. 93, Mercer Island, Wash., May 5; Carey & Kramer, Seattle, engineer.

STEEL PIPE PENDING

2225 tons, 235,000 ft of 6-in. ID, welded or seamless; bids Apr. 28 to U. S. Engineer, Chicago.

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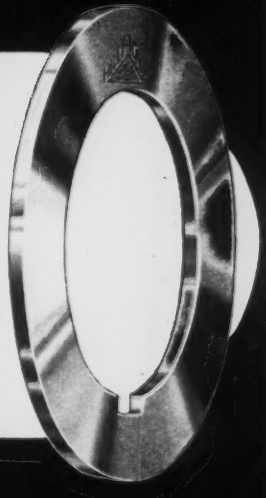

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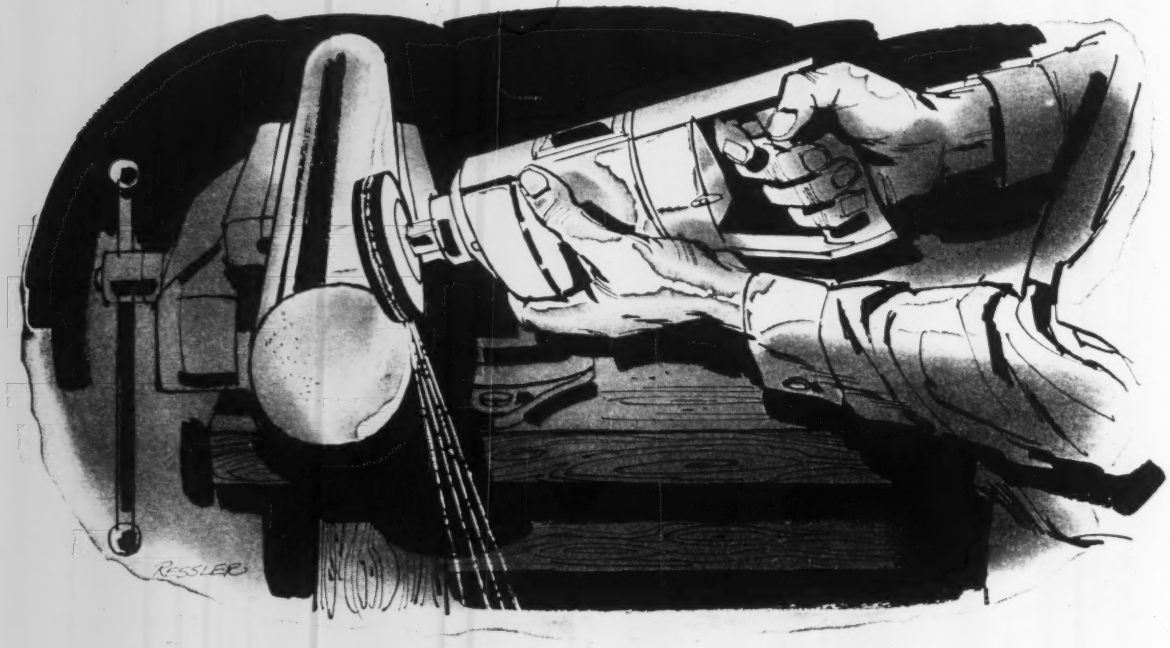

In diffused daylight, so that spark characteristics can be accurately observed, hold a sample against a clean grinding wheel revolving at high speed. A low volume spark stream of reddish-orange color with disjointed lines indicates tungsten high speed steel. It is well to have known sample for comparison

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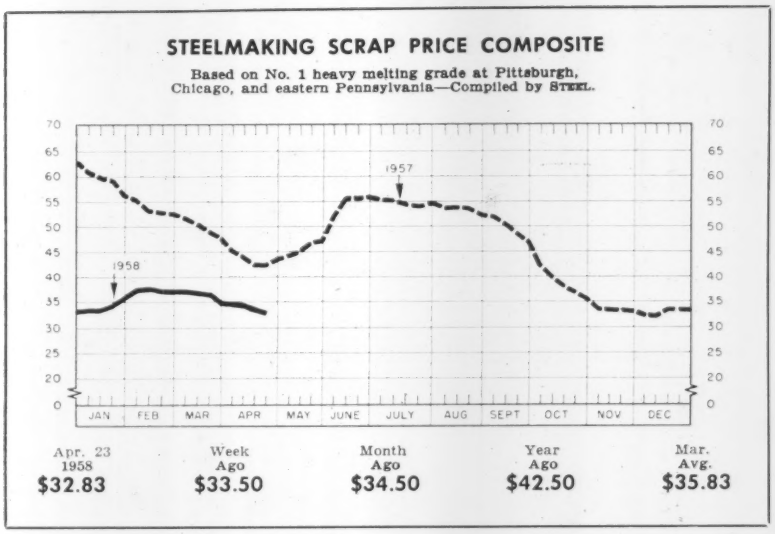
STEELMAKING SCRAP PRICE COMPOSITE
Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania—Compiled by STEEL.
1957
1958
JAN FEB MAR APR MAY JUNE JULY AUG SEPT OCT NOV DEC
Apr. 23 1958 $32.83
Week Ago $33.50
Month Ago $34.50
Year Ago $42.50
Mar. Avg. $35.83

Scrap Market Needs Buying Prop

Absence of active mill and foundry interest in dealer offerings is reflected in further price declines. STEEL's composite on the prime grade is off another 67 cents to $32.83

Scrap Prices, Page 156

Pittsburgh — Leading grades of scrap are weaker. Brokers report prices are not low enough to bring major customers into the market. The only significant purchases last week were made by a medium sized mill which bought No. 1 factory bundles at $35 and No. 2 dealer bundles at $25.

Philadelphia — Heavy melting steel scrap prices continue to slide here. They are off another $1. Electric furnace bundles are $2 lower, and declines are also reported in heavy turnings, structurals and plates, railroad steel and rail crops.

Shipments to eastern Pennsylvania mills are slow and in some cases have been held up. The bulk of activity in the Philadelphia area is in export tonnage.

New York — Brokers are paying $2 a ton less for major grades of heavy melting steel. Low phos scrap is off $1, while prices of borings and turnings are nominal with little or no tonnage moving. For No. 1 heavy melting steel, $30, shipping point, is offered, but volume is light.

Chicago—There is practically no activity in the local market following the general easing in prices ($1 a ton) a week ago. Further softening seems to be in prospect. Although there's little or no buying of the stainless grades, one local source reports that 430 bundles and solids can be had for $85 a ton, down $5 from the recent general market level.

Cleveland—Absence of buying in this area prevents a test of quoted prices, but the market is weak, and a representative purchase probably could be made below the nominal levels posted. Steelmaking operations in this district continue depressed, 27.5 per cent of capacity.

Boston—For dock delivery, export, heavy melting steel scrap is off $2 a ton to $30 on the No. 1 grade and $27 on No. 2. Buying is almost entirely for boat loading and within the $3 to $4 freight rate. Nothing is moving to eastern Pennsylvania, and only a small tonnage of No. 1 busheling is moving to Worcester, Mass.

Detroit—Scrap prices have slipped further with yards overloaded. One broker figures there's enough material on the ground to keep local mills operating at capacity for 60 days. Traders think that prices may not go much lower this month because auto lists are expected to be relatively light.

Buffalo—Reductions of $1 to $2 a ton were posted on most scrap grades here last week as dealers lowered buying prices with mill demand lacking. No. 1 heavy melting is off $2 to $27, No. 2 heavy melting is down $1 to $25, and No. 2 bundles are quoted off $1 to $23. Turnings are quoted $1 lower, but prices are largely nominal in the absence of buying. Railroad specialties, scrap rails, low phos, and other

(*Please turn to Page* 161)

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Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, Apr. 23, 1958. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Apr. 23	$32.83
Apr. 16	33.50
Mar. Avg.	35.83
Apr. 1957	43.57
Apr. 1953	42.88

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	*32.00-33.00*
No. 2 heavy melting	*28.00-29.00*
No. 1 dealer bundles	*32.00-33.00*
No. 2 bundles	*24.00-25.00*
No. 1 busheling	*32.00-33.00*
No. 1 factory bundles	*34.00-35.00*
Machine shop turnings	13.00-14.00
Mixed borings, turnings	13.00-14.00
Short shovel turnings	*17.00-18.00*
Cast iron borings	*17.00-18.00*
Cut structurals:	
2 ft and under	*39.00-40.00*
3 ft lengths	*37.00-38.00*
Heavy turnings	28.00-29.00
Punchings & plate scrap	*37.00-38.00*
Electric furnace bundles	38.00-39.00

Cast Iron Grades

No. 1 cupola	*41.00-42.00*
Stove plate	*41.00-42.00*
Unstripped motor blocks	*23.00-24.00*
Clean auto cast	*41.00-42.00*
Drop broken machinery	*49.00-50.00*

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00
Rails, 2 ft and under	*53.00-54.00*
Rails, 18 in. and under	54.00-55.00
Random rails	50.00-51.00
Railroad specialties	44.00-45.00
Angles, splice bars	47.00-48.00
Rails, rerolling	57.00-58.00

Stainless Steel Scrap

18-8 bundles & solids	*165.00-170.00*
18-8 turnings	100.00-105.00
430 bundles & solids	110.00-115.00
430 turnings	50.00-52.00

CHICAGO

No. 1 hvy melt., indus.	30.00-32.00
No. 1 hvy melt., dealer	28.00-29.00
No. 2 heavy melting	26.00-27.00
No. 1 factory bundles	33.00-34.00
No. 1 dealer bundles	30.00-31.00
No. 2 bundles	21.00-22.00
No. 1 busheling, indus.	30.00-32.00
No. 1 busheling, dealer	28.00-29.00
Machine shop turnings	15.00-16.00
Mixed borings, turnings	17.00-18.00
Short shovel turnings	17.00-18.00
Cast iron borings	17.00-18.00
Cut structurals, 3 ft	35.00-36.00
Punchings & plate scrap	37.00-38.00

Cast Iron Grades

No. 1 cupola	38.00-39.00
Stove plate	35.00-36.00
Unstripped motor blocks	30.00-31.00
Clean auto cast	43.00-44.00
Drop broken machinery	43.00-44.00

Railroad Scrap

No. 1 R.R. heavy melt.	34.00-35.00
R.R. malleable	48.00-49.00
Rails, 2 ft and under	*48.00-49.00*
Rails, 18 in. and under	*49.00-50.00*
Angles, splice bars	47.00-48.00
Axles	*51.00-53.00*
Rails, rerolling	*51.00-53.00*

Stainless Steel Scrap

18-8 bundles & solids	160.00-165.00
18-8 turnings	85.00-95.00
430 bundles & solids	*85.00-95.00*
430 turnings	45.00-50.00

YOUNGSTOWN

No. 1 heavy melting	32.00-33.00
No. 2 heavy melting	22.00-23.00
No. 1 busheling	32.00-33.00
No. 1 bundles	29.00-30.00
No. 2 bundles	21.00-22.00
Machine shop turnings	9.00-10.00
Short shovel turnings	13.00-14.00
Cast iron borings	13.00-14.00
Low phos.	34.00-35.00
Electric furnace bundles	33.00-34.00

Railroad Scrap

No. 1 R.R. heavy melt.	35.00-36.00

CLEVELAND

No. 1 heavy melting	29.00-30.00
No. 2 heavy melting	19.00-20.00
No. 1 factory bundles	31.00-32.00
No. 1 bundles	29.00-30.00
No. 2 bundles	20.00-21.00
No. 1 busheling	29.00-30.00
Machine shop turnings	7.00-8.00
Short shovel turnings	11.00-12.00
Mixed borings, turnings	11.00-12.00
Cast iron borings	11.00-12.00
Cut foundry steel	34.00-35.00
Cut structurals, plates 2 ft and under	35.00-36.00
Low phos. punchings & plate	30.00-31.00
Alloy free, short shovel turnings	16.00-17.00
Electric furnace bundles	30.00-31.00

Cast Iron Grades

No. 1 cupola	42.00-43.00
Charging box cast	33.00-34.00
Heavy breakable cast	33.00-34.00
Stove plate	42.00-43.00
Unstripped motor blocks	25.00-26.00
Brake shoes	33.00-34.00
Clean auto cast	42.00-43.00
Burnt cast	30.00-31.00
Drop broken machinery	47.00-48.00

Railroad Scrap

R.R. malleable	60.00-61.00
Rails, 2 ft and under	56.00-57.00
Rails, 18 in. and under	57.00-58.00
Rails, random lengths	49.00-50.00
Cast steel	44.00-45.00
Railroad specialties	47.00-48.00
Uncut tires	40.00-41.00
Angles, splice bars	46.00-47.00
Rails, rerolling	51.00-52.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	160.00-165.00
18-8 turnings	90.00-95.00
430 clips, bundles, solids	75.00-80.00
430 turnings	40.00-50.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	32.00
No. 2 heavy melting	30.00
No. 1 bundles	32.00
No. 2 bundles	23.00
No. 1 busheling	32.00
Machine shop turnings	16.00
Short shovel turnings	18.00

Cast Iron Grades

No. 1 cupola	*40.00*
Charging box cast	33.00
Heavy breakable cast	33.00
Unstripped motor blocks	*34.00*
Clean auto cast	45.00
Stove plate	*38.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*35.00*
Rails, 18 in. and under	*50.00*
Rails, random lengths	*44.00*
Rails, rerolling	*53.00*
Angles, splice bars	*45.00*

BIRMINGHAM

No. 1 heavy melting	30.00-31.00
No. 2 heavy melting	25.00-26.00
No. 1 bundles	30.00-31.00
No. 2 bundles	19.00-20.00
No. 1 busheling	30.00-31.00
Cast iron borings	12.00-13.00
Machine shop turnings	22.00-23.00
Short shovel turnings	23.00-24.00
Bar crops and plates	38.00-39.00
Structurals & plates	38.00-39.00
Electric furnace bundles	35.00-36.00
Electric furnace:	
2 ft and under	34.00-35.00
3 ft and under	33.00-34.00

Cast Iron Grades

No. 1 cupola	*48.00-49.00*
Stove plate	*48.00-49.00*
Unstripped motor blocks	*37.00-38.00*
Charging box cast	22.00-23.00
No. 1 wheels	36.00-37.00

Railroad Scrap

No. 1 R.R. heavy melt.	33.00-34.00
Rails, 18 in. and under	47.00-48.00
Rails, rerolling	47.00-48.00
Rails, random lengths	41.00-42.00
Angles, splice bars	*39.00-40.00*

PHILADELPHIA

No. 1 heavy melting	*56.00*
No. 2 heavy melting	*53.00*
No. 1 bundles	*56.00*
No. 2 bundles	*25.00*
No. 1 busheling	*56.00*
Electric furnace bundles	*56.00*
Mixed borings, turnings	*17.50†*
Short shovel turnings	*20.00†*
Machine shop turnings	*17.50†*
Heavy turnings	*32.00*
Structural & plate	*40.00-41.00*
Couplers, spring, wheels	*44.00*
Rail crops, 2 ft. & under	*56.00-58.00*

Cast Iron Grades

No. 1 cupola	39.00
Heavy breakable cast	42.00
Malleable	*59.00-60.00*
Drop broken machinery	*48.00-49.00*

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*30.00-31.00*
No. 2 heavy melting	*26.00-27.00*
No. 1 bundles	*30.00-31.00*
No. 2 bundles	*17.00-18.00*
Machine shop turnings	8.00-9.00†
Mixed borings, turnings	10.00-11.00†
Short shovel turnings	12.00-13.00†
Low phos. (structurals & plates	*33.00-34.00*

Cast Iron Grades

No. 1 cupola	35.00-36.00
Unstripped motor blocks	26.00-27.00
Heavy breakable	33.00-34.00

Stainless Steel

18-8 sheets, clips, solids	140.00-145.00
18-8 borings, turnings	50.00-55.00
410 sheets, clips, solids	50.00-55.00
430 sheets, clips, solids	70.00-75.00

BUFFALO

No. 1 heavy melting	*26.00-27.00*
No. 2 heavy melting	*24.00-25.00*
No. 1 bundles	*26.00-27.00*
No. 2 bundles	*22.00-23.00*
No. 1 busheling	*26.00-27.00*
Mixed borings, turnings	*13.00-14.00*
Machine shop turnings	*11.00-12.00*
Short shovel turnings	*14.00-15.00*
Cast iron borings	*13.00-14.00*
Low phos. structurals and plate, 5 ft and under	*31.00-32.00*
2 ft and under	*35.00-36.00*

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	41.00-42.00
No. 1 machinery	46.00-47.00

Railroad Scrap

Rails, random lengths	*45.00-46.00*
Rails, 3 ft and under	*51.00-52.00*
Railroad specialties	*35.00-36.00*

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	28.50-29.50
No. 2 heavy melting	25.50-26.50
No. 1 bundles	28.50-29.50
No. 2 bundles	19.00-20.00
No. 1 busheling	28.50-29.50
Machine shop turnings	12.00-13.00
Mixed borings, turnings	11.00-12:00
Short shovel turnings	14.00-15.00
Cast iron borings	11.00-12.00
Low phos. 18 in.	36.00-37.00

Cast Iron Grades

No. 1 cupola	38.00-39.00
Heavy breakable cast	32.00-33.00
Charging box cast	32.00-33.00
Drop broken machinery	45.00-46.00

Railroad Scrap

No. 1 R.R. heavy melt.	*33.00-34.00*
Rails, 18 in. and under	52.00-53.00
Rails, random lengths	43.00-44.00

HOUSTON

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	32.00†
No. 2 heavy melting	30.00†
No. 2 bundles	22.00†
Machine shop turnings	15.00†
Crushed turnings	19.00†
Low phos. plates, structurals	36.00†

Cast Iron Grades

No. 1 cupola	38.00†
Heavy breakable	30.00†
Unstripped motor blocks	33.50

Railroad Scrap

No. 1 R.R. heavy melt.	34.00†

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	24.00-25.00
No. 2 heavy melting	19.00-20.00
No. 1 bundles	24.00-25.00
No. 2 bundles	14.00-15.00
No. 1 busheling	24.00-25.00
Machine shop turnings	7.00-8.00†
Mixed borings, turnings	7.00-8.00
Short shovel turnings	8.00-9.00
No. 1 cast	29.00-30.00
Mixed cupola cast	28.00-29.00
No. 1 machinery cast	33.00-34.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*20.00-21.00*
No. 2 heavy melting	*16.00-17.00*
No. 1 bundles	*21.00-22.00*
No. 2 bundles	12.00-13.00
No. 1 busheling	*20.00-21.00*
Machine shop turnings	5.00-6.00
Mixed borings, turnings	6.00-7.00
Short shovel turnings	7.00-8.00
Punchings & plate	*25.00-26.00*

Cast Iron Grades

No. 1 cupola	*27.00-28.00*
Stove plate	*22.00-23.00*
Charging box cast	*21.00-22.00*
Heavy breakable	*20.00-21.00*
Unstripped motor blocks	11.00-12.00
Clean auto cast	*28.00-29.00*

SEATTLE

No. 1 heavy melting	30.00
No. 2 heavy melting	28.00
No. 1 bundles	24.00
No. 2 bundles	23.00
Machine shop turnings	16.00
Mixed borings, turnings	16.00
Electric furnace No. 1	38.00

Cast Iron Grades

No. 1 cupola	31.00
Heavy breakable cast	28.00
Unstripped motor blocks	23.00
Stove plate (f.o.b. plant)	21.00

LOS ANGELES

No. 1 heavy melting	**32.00**
No. 2 heavy melting	**30.00**
No. 1 bundles	**28.00**
No. 2 bundles	**20.00**
Machine shop turnings	**9.00**
Shoveling turnings	**11.00**
Cast iron borings	**10.00**
Cut structurals and plate 1 ft and under	**43.00**

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	**38.00**

Railroad Scrap

No. 1 R.R. heavy melt.	**32.00**

SAN FRANCISCO

No. 1 heavy melting	**32.00**
No. 2 heavy melting	**30.00**
No. 1 bundles	**30.00**
No. 2 bundles	**22.00**
Machine shop turnings	**15.00**
Mixed borings, turnings	**15.00**
Cast iron borings	**15.00**
Heavy turnings	**15.00**
Short shovel turnings	**15.00**
Cut structurals, 3 ft	**40.00**

Cast Iron Grades

No. 1 cupola	**42.00**
Charging box cast	**34.00**
Stove plate	**34.00**
Heavy breakable cast	**28.00**
Unstripped motor blocks	**31.00**
Clean auto cast	**40.00**
Drop broken machinery	**40.00**
No. 1 wheels	**34.00**

HAMILTON, ONT.

No. 1 heavy melting	30.00
No. 2 heavy melting	26.00
No. 1 bundles	30.00
No. 2 bundles	23.00
Mixed steel scrap	25.00
Mixed borings, turnings	15.00
Busheling, new factory:	
Prepared	30.00
Unprepared	24.00
Short steel turnings	19.00

Cast Iron Gradest

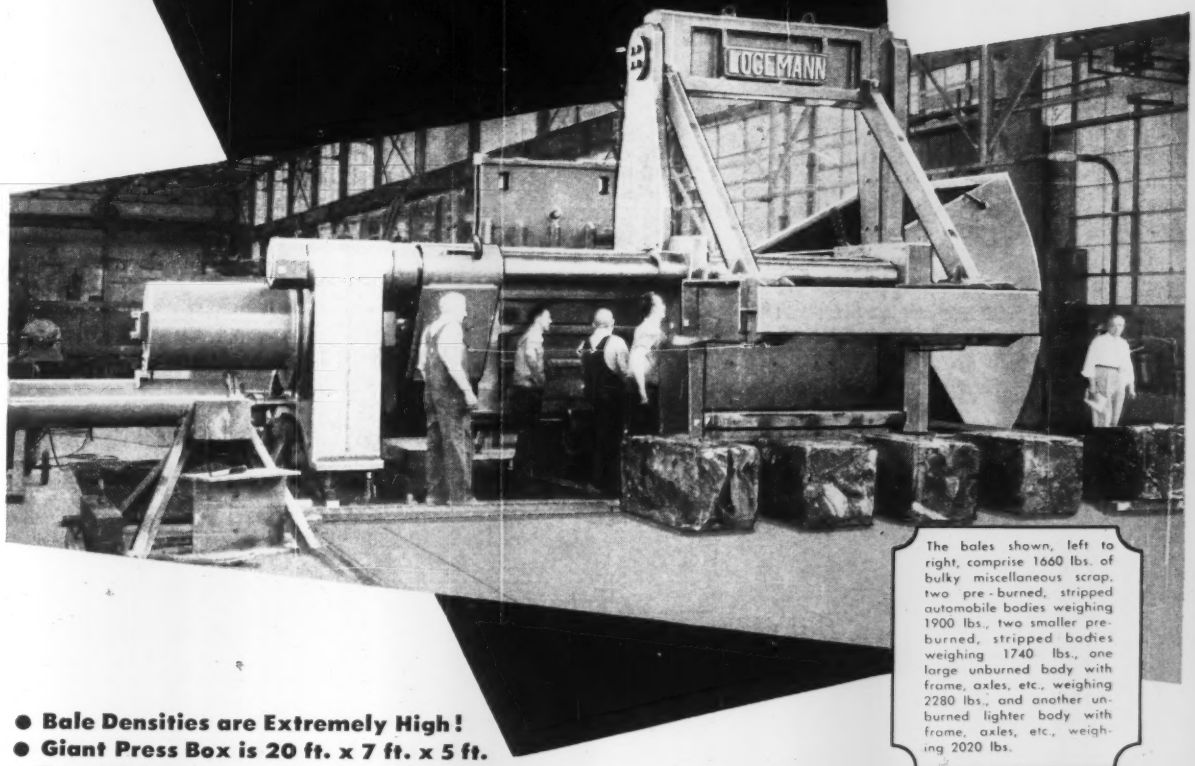
No. 1 machinery cast	45.00-50.00

†Nominal.
‡F.o.b. Hamilton, Ont.

LOGEMANN *presents*

the new giant triple-compression 4000-P Series of

SCRAP PRESSES



The bales shown, left to right, comprise 1660 lbs. of bulky miscellaneous scrap, two pre-burned, stripped automobile bodies weighing 1900 lbs., two smaller pre-burned, stripped bodies weighing 1740 lbs., one large unburned body with frame, axles, etc., weighing 2280 lbs., and another unburned lighter body with frame, axles, etc., weighing 2020 lbs.

- **Bale Densities are Extremely High!**
- **Giant Press Box is 20 ft. x 7 ft. x 5 ft.**
- **Two 150 HP Pumps Generate Hydraulic Pressure**

In this Logemann Scrap Press compressed bales measure 24 inches by 24 inches by a variable third dimension which is determined by the character and quantity of scrap charged. The first or gathering ram compresses the load of scrap from 20 ft. to 2 ft. . . . the intermediate side ram reduces the cross-dimension from 7 ft to 2 ft. . . . finally the third or finishing ram moves upward, to compress the vertical dimension into an extremely dense bale, ready for remelting. The cover is then withdrawn and the finishing ram elevates the compressed bale level with the top of the box, to allow the cover to push it off for loading into cars.

Two large 150 HP pumps generate hydraulic pressure for operating the press-rams at high pressures. Three smaller pumps are used to operate the press cover and the loading hopper. This hopper can be filled with miscellaneous scrap while the press is making a bale, and then dumped quickly into the box as soon as the preceding bale has been discharged.

The large pumps give rapid movement to all rams, and to handle their fluid delivery the operating-valves are proportionately over-size. These valves are operated by compressed air and easily controlled from a remote stand, through a bank of electrical switches and push-buttons, in front of the operator.

This same press can be used for baling bodies and extremely bulky scrap, also for making standard size, high-density bales of new sheet clips.

We are prepared to build many smaller sizes or larger, if required, to meet your specific requirements. You are invited to present your problem for discussion.

Write for details about the newly developed 3500-P series with tamping cover and side bale ejection and the new giant double compression press with box 20 ft. long, 7½ ft. wide, and 5 ft. deep.

LOGEMANN BROTHERS CO.

3126 W. BURLEIGH STREET • MILWAUKEE 10, WISCONSIN

Titanium Mill Prices Cut

Industry hopes to stimulate demand by making price more attractive. Copper down in March, but April looks better. Sales are perking up, and production is being curtailed

Nonferrous Metal Prices, Pages 160 & 161

TITANIUM mill product prices have been slashed sharply in a series of quiet moves over the last eight weeks. The revisions mark the seventh reduction in mill prices since 1954 and follow the industry's announced intention to make the metal more competitive price-wise.

Delay—The changes would probably have been made last December if orders hadn't come to a virtual standstill. Mill product shipments in the first two months of the first quarter weren't good (445,478 lb in February, 415,744 lb in January), but they were substantially above those of the fourth quarter. Business is holding around the February level. The industry evidently figures now is a good time to make the metal more attractive to designers.

Here's the chronological breakdown of the adjustments:

They started on Mar. 13 when Titanium Metals Corp. of America reduced the commercially pure wire quotation about 13 per cent. On Mar. 18, TMCA pruned the price on seven grades of plates 23 to 25 per cent and followed on Mar. 19 with a 30 per cent cut in four grades of billets.

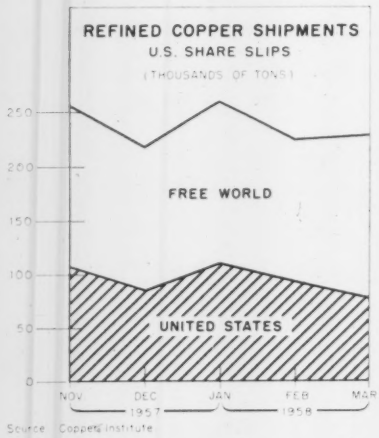
On Apr. 1, Du Pont slashed its sponge price 20 cents a pound. Three days later, TMCA marked down some plates as much as 20 per cent and trimmed the price of 6-4 (6 per cent aluminum, 4 per cent vanadium) billets 30 per cent.

Latest—On Apr. 23, TMCA completed its reduction with these changes: Commercially pure sheets and strip cut 10 per cent, bars cut 15 to 20 per cent, billets cut 30 to 45 per cent (additional adjustments).

It's expected that all producers will have to meet TMCA's prices. As one told STEEL: "We have done nothing, but we are evaluating the situation. After all, we must remain competitive."

Copper Down in March

Shipments of refined copper in the U. S. fell sharply in March (see chart) with the result that producers' stocks rose 37,000 tons to 238,641 tons. Refined production climbed about 2000 tons to the 130,075 ton mark.



Source: Copper Institute

April statistics should be better. Custom smelter sales have shown greater strength lately. Some observers believe that current demand will cause custom smelters to raise their price a half cent to 24 cents a pound.

Another promising development is the news that Kennecott Copper Corp. is again reducing output at domestic mines (the third cutback this year).

Kennecott's domestic operation is around 67 per cent of its 1957 rate.

The strike continues at Anaconda Co.'s Chuquicamata (Chile) mine. It means a loss of around 20,000 tons monthly to the already copper-hungry European market. Kennecott may be in for its share of troubles in Chile: Its contract with Braden miners expires June 30.

Aluminum Output Up

Primary aluminum production hit 137,916 tons in March and brought the first quarter total to 403,427 tons, reports the Aluminum Association. It exceeds output in the first quarter of 1957 by some 2000 tons even though substantial cutbacks have been made by most producers. The reason for the apparent paradox is twofold: 1. Several projects which increased the industry's capacity were completed early this year. 2. Some curtailments have not been felt.

Look for more production slashes. Latest to join the parade is Reynolds Metals Co. which will trim output at its Longview, Wash., and Troutdale, Oreg., plants by 15 per cent on May 1.

Says President Richard S. Reynolds Jr.: "At this time, our commercial requirements are absorbing about 70 per cent of our production. Our policy generally will be to shut down the higher cost lines in our plants affected by freight rates, power rates, or other factors."

NONFERROUS PRICE RECORD

	Price Apr. 23	Last Change	Previous Price	Mar. Avg	Feb. Avg	Apr., 1957 Avg
Aluminum	24.00	Apr. 1, 1958	26.00	26.000	26.000	25.000
Copper	23.50-25.00	Apr. 8, 1958	24.00-25.00	24.163	24.298	31.598
Lead	11.80	Apr. 1, 1958	12.80	12.800	12.800	15.800
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	93.00	Apr. 17, 1958	92.75	93.425	93.818	99.276
Zinc	10.00	July 1, 1957	10.50	10.000	10.000	13.500

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig, 99.8%, Velasco, Tex.

Does specialized business publication advertising help salesmen?

No one is in a better position to give a hard-boiled, practical answer to this question than the men who spend their working lives on the sales front... the men the ads are supposed to help... the men who sell.

Here is the statement of a salesman who knows what advertising does for him when it appears in the industrial, trade or professional publications that serve the specialized markets to which he sells:

W. A. Beach
Black & Decker Mfg. Co.
sells to wholesalers and retailers

says Mr. Beach:

"We have to sell our product first to the wholesaler; then help him sell to the retailer. We do a lot of missionary work. We make calls with the wholesaler salesmen and we run dealer and clerk training clinics in which we try to help the dealers improve their merchandising.

"Our trade advertising in publications read by the wholesaler and dealer, works with us along those same lines. In other words, it's like having an additional sales representative in each territory constantly calling on the dealers and wholesalers. Every time they open their trade books he tells them about our products and the special promotions we run to help them sell more. He works nights too, and calls on them at home when they're doing their reference work and planning. I know they do take their magazines home at night and read them. So, in effect, this 'salesman' works at night for us, and I do believe he finds them in a more receptive mood at that time.

"The greatest evidence that our advertising is out there doing a job and really paying off is in connection with the two large-scale promotions we do each year.

"For instance, right now we're working on our current Christmas promotion called 'The Bell-Ringer'. That was announced in September. Between the announcement and the Christmas selling season we must sell the wholesaler and then set up a schedule with each wholesaler to go out with his men and call on the trade and actually sell the deal to the retailer. You can imagine how tight our schedule is. In this short span of time we have to call on practically every hardware dealer in the territory. It adds up to a terrific number of calls and in order to get around, we just can't afford to give each dealer all the time we'd like to. In addition, it's extremely difficult to explain all the details on something like this Christmas promotion in the short time allotted each dealer.

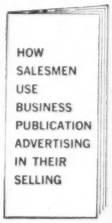
"We couldn't do it if the advertising wasn't in there doing part of the work for us. Believe me, it's wonderful to find that when you do call on a wholesaler or dealer you don't have to take the time to explain all the details, because he has already read about it in the hardware publications. In most cases he's ready to see the merchandise. We have the opportunity to close the sale in short order. Right now I'm engaged in making dealer calls with wholesalers' salesmen and I'd say that nine cases out of ten the dealers have already seen our ads on the Christmas promotion and are somewhat pre-sold on the deal. In fact, in most cases I've found that all I have to do is show him the merchandise."

Ask your own salesmen

what your company's business publication advertising does for them. If their answers are generally favorable, you can be sure that it is really helping them sell. If too many answers are negative, it could well pay you to review your advertising objectives—and to make sure the publications that carry your advertising are read by the men who must be sold.

How salesmen use their companies' advertising to get more business

Here's a useful package of ideas for the sales manager, advertising manager or agency man who would like to get more horsepower out of his advertising. Send for a free copy of the pocket size booklet which reports the successful methods employed by eleven salesmen who tell how they get more value out of their companies' business publication advertising.



You can be sure that more of your salesmen will use your advertising after they read how others get business through these simple methods.

The coupon is for your convenience in sending for your free copy.

NATIONAL BUSINESS PUBLICATIONS, INC.

NBP

...each of which serves a specialized market in a specific industry, trade or profession.

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Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 24.00; ingots, 26.10. 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 27.90; No. 43, 27.70; No. 195, 28.70; No. 214, 29.50; No. 356, 27.90, 30-lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 23.50-24.50, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per ton, ton lots.

Cadmium: Sticks and bars, $1.55 per lb deld.

Cobalt: 97-99%, $2.00 per lb for 550-lb keg; $2.02 per lb for 100 lb case; $2.07 per lb under 100 lb.

Columbium: Powder, $55-90 per lb, nom.

Copper: Electrolytic, 25.00 deld.; custom smelters, 23.50; lake, 25.00 deld.; fire refined, 24.75 deld.

Germanium: First reduction, $179.17-197.31 per lb; intristic grade, $197.31-220 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $70-90 nom. per troy oz.

Lead: Common, 11.80; chemical, 11.90; corroding, 11.90, St. Louis, New York basis, add 0.20.

Lithium: 98 + %, 50-100 lb, cups or ingots, $12; rod, $15; shot or wire, $16. 100-500 lb, cups or ingots, $10.50; rod, $14; shot or wire $15, f.o.b. Minneapolis.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. thick, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $232-237 per 76-lb flask.

Molybdenum: Unalloyed, turned extrusions, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb or more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 779.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 1.01. Nickel oxide sinter, 71.25 per lb of nickel content before 1 cent freight allowance, f.ob. Copper Cliff, Ont.

Osmium: $70-100 per troy oz nom.

Palladium: $19-21 per troy oz.

Platinum: $68-75 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $118-125 per troy oz.

Ruthenium: $45-55 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market, 88.625 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Rod, $60 per lb; sheet, $55 per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 93.00.

Titanium: Sponge, 99.3 + %, grade A-1 ductile (0.3% Fe max.), $2.05; grade A-2 (0.5% Fe max.), $1.85 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $3.15 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.85.

Zinc: Prime Western, 10.00; brass special, 10.25; intermediate, 10.50, East St. Louis, freight allowed over 0.50 per lb, New York basis, add 0.50. High grade, 11.00; special high grade, 11.25 deld. Diecasting alloy ingot No. 3, 13.75; No. 2, 14.75; No. 5, 14.25 deld.

Zirconium: Sponge, commercial grade, $5-10 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 24.00-24.50; No. 12 foundry alloy (No. 2 grade), 21.25-21.50; 5% silicon alloy, 0.60 Cu max., 24.00-24.25; 13 alloy, 0.60 Cu max., 24.00-24.25; 195 alloy, 24.25-25.50; 108 alloy, 21.75. Steel deoxidizing grades, notch bars, granulated or shot; Grade 1, 23.25; grade 2, 21.25; grade 3, 20.00; grade 4, 18.00.

Brass Ingot: Red brass, No. 115, 25.25; tin bronze, No. 225, 34.00, No. 245, 28.75; high-leaded tin bronze, No. 305, 29.25, No. 1 yellow, No. 405, 20.75; manganese bronze, No. 421, 23.00.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.80, f.o.b. Temple, Pa., or Reading, Pa.; rod, bar, wire, $1.78, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 30.355; l.c.l., 30.98. Weatherproof, 30,000-lb lots, 32.53; l.c.l., 33.28. Magnet wire deld., 38.43, before quantity discounts.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $17.50 per cwt; pipe, full coils, $17.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip, $8.50-15.95; sheared mill plate, $6.00-9.50; wire, $6.50-11.00; forging billets, $4.10-4.35; hot-rolled and forged bars, $5.25-6.35.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, $24.00; plate, $12.50-19.20; H.R. strip, $12.50-22.90; $11.00-17.40.

ZIRCONIUM

C.R. strip, $15.90-31.25; forged or H.R. bars, ribbon zinc in coils, 20.50; plates, 19.00.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strips, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003, and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range, Inches	Flat Sheet	Coiled Sheet
0.249-0.136	41.10-45.60	.....
0.135-0.096	41.60-46.70	.....
0.125-0.096	.....	38.50-39.10
0.095-0.077	42.30-48.50	38.60-39.30
0.076-0.061	42.90-50.80	38.80-40.00
0.060-0.048	43.60-53.10	39.40-41.10
0.047-0.038	44.20-55.90	39.90.32.50
0.037-0.030	44.60-60.90	40.30-44.30
0.029-0.024	45.20-52.70	40.60-45.00
0.023-0.019	46.20-56.10	41.70-43.40
0.018-0.017	47.00-53.40	42.30-44.00
0.016-0.015	47.90-54.30	43.10-44.80
0.014	48.90	44.10-45.80
0.013-0.012	50.10	44.80
0.011	51.10	46.00
0.010-0.0095	52.60	47.40
0.009-0.0085	53.90	48.90
0.008-0.0075	55.50	50.10
0.007	57.00	51.60
0.006	58.60	53.00

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	41.70	46.50
5050-F	42.80	47.60
3004-F	43.80	49.50
5052-F	44.40	50.20
6061-T6	44.90	51.00
2024-T4	48.60	55.40
7075-T6*	56.40	64.00

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in. or across flats)	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	76.20	73.20	.....	.....
0.156	64.20	61.40	.....	.....
0.172	.....	61.40	.....	.....
0.188	64.20	61.40	.....	79.60
0.203	64.20	61.40	.....	.....
0.219-0.234	61.00	59.50	.....	.....
0.250	61.00	59.50	88.40	75.90
0.266-0.281	61.00	59.50	.....	.....
0.313	61.00	59.50	81.40	72.20
0.344	60.50	.....	81.40	.....
Cold-Finished				
0.375-0.547	60.50	59.30	72.80	67.80
0.563-0.688	60.50	59.30	69.10	63.50
0.719	.....	57.70	.....	.....
0.750-1.000	59.00	57.70	62.90	59.70
1.063	59.00	57.70	.....	57.60
1.250-1.500	56.60	55.40	60.80	57.60
Rolled				
1.563	55.00	53.70	.....	.....
1.625-2.000	54.30	52.90	59.60	55.50
2.063	.....	51.40	.....	.....
2.125-2.500	52.80	51.40	.....	55.50
2.500-3.000	51.20	49.70	.....	55.50
3.250-3.375	.....	49.70	.....	.....

Forging Stock: Round, Class 1, random lengths, diam. 0.688-8 in., "F" temper; 2014, 41.50-54.30; 6061, 40.90-54.30; 7075, 42.90-56.30; 7079, 43.40-56.80.

Pipe: ASA schedule 40, alloy 6063-T6, standard lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
¾	$18.60	2	$ 57.40
1	29.35	4	157.60
1¼	39.75	6	282.95
1½	47.50	8	425.80

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	45.40-47.00	58.60-62.80
12-14	45.70-47.20	59.30-63.80
15-17	45.90-47.90	60.50-65.50
18-20	46.50-48.30	62.50-68.10

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grade, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths; .125 in., 74.90; .188 in., 71.70-72.70; .25-.75 in., 70.60-71.60. Tooling plate, .25-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)

Aluminum: 1100 clippings, 12.00-12.50; old sheets, 9.00-9.50; borings and turnings, 5.00-

BRASS MILL PRICES

MILL PRODUCTS a — SCRAP ALLOWANCES f

	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.13b	45.36c	....	48.32	21.000	21.000	20.250
Yellow Brass	42.69	31.03d	43.23	45.60	16.125	15.875	14.500
Low Brass, 80%	44.90	44.84	45.44	47.71	17.875	17.625	17.125
Red Brass, 85%	45.67	45.61	46.21	48.48	18.625	18.375	17.875
Com. Bronze, 90%	46.98	46.92	47.52	49.54	19.250	19.000	18.500
Manganese Bronze	50.81	44.91	55.44	....	14.875	14.625	14.125
Muntz Metal	45.19	41.00	....	....	15.125	14.875	14.375
Naval Brass	47.07	41.38	54.13	50.48	14.875	14.625	14.125
Silicon Bronze	52.84	52.03	52.88	54.77	20.625	20.375	19.625
Nickel Silver, 10%	57.93	60.26	60.26	....	21.125	20.875	10.562
Phos. Bronze, A-5%	67.17	67.67	67.67	68.85	21.875	21.625	20.625

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, or any or all kinds of scrap, add 1 cent per lb.

5.50; crankcase, 9.00-9.50; industrial castings, 9.00-9.50.

Copper and Brass: No. 1 heavy copper and wire, 17.50-18.00; No. 2 heavy copper and wire, 15.50-16.00; light copper, 13.50-14.00; No. 1 composition red brass, 14.50-15.00; No. 1 composition turnings, 13.50-14.00; new brass clippings, 13.00-13.50; light brass, 8.00-8.50; heavy yellow brass, 10.00-10.50; new brass rod ends, 11.00-11.50; auto radiators, unsweated, 11.00-11.50; cocks and faucets, 12.00-12.50; brass pipe, 12.00-12.50.

Lead: Heavy, 7.50-8.00; battery plates, 2.75-3.00; linotype and stereotype, 9.75-10.25; electrotype, 9.00-9.50; mixed babbitt, 10.50-11.00.

Monel: Clippings, 28.00-29.00; old sheets, 25.00-26.00; turnings, 20.00-23.00; rods, 28.00-29.00.

Nickel: Sheets and clips, 42.00-45.00; rolled anodes, 42.00-45.00; turnings, 37.00-40.00; rod ends, 42.00-45.00.

Zinc: Old zinc, 3.00-3.25; new diecast scrap, 2.75-3.00; old diecast scrap, 1.50-1.75.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 15.50-16.25; 3003 clippings, 15.50-16.25; 6151 clippings, 15.50-16.50; 5052 clippings, 15.00-15.75; 2014 clippings, 15.00-15.25; 2017 clippings, 15.00-15.25; 2024 clippings, 15.00-15.25; mixed clippings, 14.00-14.75; old sheets, 11.50-12.25; old cast, 11.50-12.25; clean old cable (free of steel), 14.50-15.25; borings and turnings, 12.00-13.00.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 51.00; light scrap, 46.00; turnings and borings, 31.00.

Copper and Brass: No. 1 heavy copper and wire, 20.00; No. 2 heavy copper and wire, 18.00; light copper, 15.75; refinery brass (60% copper) per dry copper content, 17.50.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 20.00; No. 2 heavy copper and wire, 18.00; light copper, 15.75; No. 1 composition borings, 17.25; No. 1 composition solids, 17.75; heavy yellow brass solids, 12.25; yellow brass turnings, 11.50; radiators, 13.75.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70

Copper: Flat-rolled, 41.79; oval, 40.00, 5000-10,000 lb; electrodeposited, 31.25, 2000-5000 lb lots; cast, 36.25, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 111.50; 200-499 lb, 110.00; 500-999 lb, 109.50; 1000 lb or more, 109.00.

Zinc: Balls, 16.00; flat tops, 16.00; flats, 19.25; ovals, 18.50, ton lots.

CHEMICALS

Cadmium Oxide: $1.70 per lb in 100-lb drums.

Chromic Acid: 100 lb, 33.30; 500 lb, 32.80; 2000 lb, 32.15; 5000 lb, 31.80; 10,000 lb, 31.30; f.o.b. Detroit.

Copper Cyanide: 100-200 lb, 68.40; 300-900 lb, 66.40; 1000-19,900 lb, 64.40.

Copper Sulphate: 100-1900 lb, 13.70; 2000-5900 lb, 11.70; 6000-11,900 lb, 11.45; 12,000-22,900 lb, 11.20; 23,000 lb or more, 10.70.

Nickel Chloride: 100 lb, 48.50; 200 lb, 46.50; 300 lb, 45.50; 400-999 lb, 43.50; 10,000 lb or more, 40.50.

Nickel Sulphate: 5000-22,000 lb, 33.50; 23,000-35,900 lb, 33.00; 36,000 lb or more, 32.50.

Sodium Cyanide: 100 lb, 27.60; 200 lb, 25.90; 400 lb, 22.90; 1000 lb, 21.90; f.o.b. Detroit.

Sodium Stannate: Less than 100 lb, 74.70; 100-600 lb, 65.80; 700-1900 lb, 63.00; 2000-9900 lb, 61.20; 10,000 lb or more, 59.80.

Stannous Chloride (anhydrous): Less than 25 lb, 164.10; 25 lb, 129.10; 100 lb, 114.10; 400 lb, 111.60; 5200-19,600 lb, 99.40; 20,000 lb or more, 87.20.

Stannous Sulphate: Less than 50 lb, 126.90; 50 lb, 96.90; 100-1900 lb, 94.90; 2000 lb or more, 92.90.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(*Concluded from Page 155*)

higher-priced specialties are down $2.

Cincinnati — Present quotations have not been tested by buying, and prices are unchanged except for No. 1 railroad heavy melting which is quoted off $1 to $33-$34.

Brokers have filled the limited mill orders placed at the opening of the month, and they find little that's promising in the immediate outlook.

St. Louis—Scrap prices are still slipping with demand sketchy. Most large dealers hold heavy inventories, and mill stocks are large. They are buying little. Several cast iron grades are quoted down $1 to $4 a ton. The biggest drop has been in railroad material; every item in this category fell—from $2 on No. 1 R.R. heavy melting, angles, and splice bars, to $4 on rails 18 in. and under, and random lengths. Another drop in railroad scrap is seen.

Birmingham—Although there is some movement of scrap in nearly all grades, no large quantities are being bought. Biggest purchaser last week was a Georgia mill; which bought No. 2 heavy melting at $30, delivered Atlanta.

In cast iron, some users are buying limited amounts at $1 under last quoted prices. The electric furnace grades are steady on the few sales reported.

A couple of ships are loading scrap for export at Florida ports.

Houston—The scrap market here will get no significant mill or export support during May. The leading district mill will limit purchases for May-delivered scrap to crushed short shoveling turnings from an industrial producer. The second Texas mill will not buy any scrap during the month.

Exporters anticipate no revival of demand during May. Mexican requirements appear to have been filled.

Most broker prices are nominal, and they are likely to go lower in coming weeks. Some dealers are reported in financial trouble.

San Francisco — Little action is noted in the local steel scrap market. One mill, operating at 75 to 80 per cent of capacity, is using heavy charges of scrap in its melts.

Los Angeles—Scrap prices are unchanged and the market undertone remains weak in the absence of buying. No export activity is reported.

Seattle—Many scrapyards here are practically idle. Big consumers have ample stocks and sales are insufficient to establish firm price levels. The mills are expected to post their May prices about $2 under those now nominally quoted.

This city recently sold about 100 tons of scrap rails to Sternoff Metals Corp., Seattle, at $20.59 a short ton.

Returning from a trip to the Orient, a local scrap broker says Japan has purchased nine full cargoes of scrap to be shipped in the third quarter from California and Gulf ports. These contracts are said to be at $46, c.i.f., on a basis of 40 per cent No. 1 heavy melting, 40 per cent No. 2, and 20 per cent No. 1 bundles. The delivered price is segregated: Base price in U. S. $33; freight and insurance $7; stevedoring $6.

This broker also says Japanese

CLASSIFIED

Help Wanted

EXPERIENCED SALESMAN in the field of Steel Mill and Heavy Industrial Overhead Traveling Cranes wanted to handle Ohio and some surrounding territory. Answer Box 657, STEEL, Penton Bldg., Cleveland 13, Ohio.

Positions Wanted

METALLURGICAL CONSULTANT
Available for Melt Shop Problems in technical and customer service. Broad industrial experience in all processes for carbon, low and high alloy iron and steelmaking. Box 640, STEEL, Penton Bldg., Cleveland 13, Ohio.

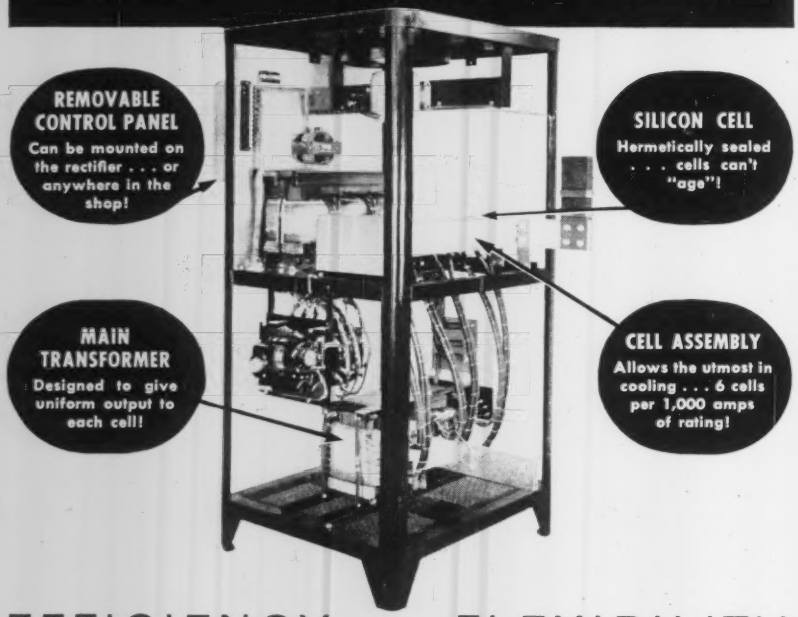
SALES MANAGER FLAT DIE HAMMER FORGINGS. Located in Ohio at present. Have sales in the Great Lakes states. 20 years experience. College educated. 40 years of age. Reply Box 659, STEEL, Penton Bldg., Cleveland 13, Ohio.

QUALITY CONTROL ENGINEER—Experienced in all phases of quality control, including statistical analysis methods. Married. Best references. College Grad. Write Box 660, STEEL, Penton Bldg., Cleveland 13, Ohio.

METALLURGIST SEEKING SALES POSITION. Supervisory experience in steel tubing production and fabrication. Alloy forging, quality control and some sales experience. Write Box 661, STEEL, Penton Bldg., Cleveland 13, Ohio.

CLASSIFIED RATES
All classifications other than "Positions Wanted" set solid, 50 words or less $15.00, each additional word .30, all capitals, 50 words or less $19.20, each additional word .38; all capitals leaded, 50 words or less $23.40, each additional word .47. "Positions Wanted" set solid, 25 words or less $3.60, each additional word .14, all capitals, 25 words or less $4.50, each additional word .18; all capital leaded, 25 words or less $5.40, each additional word .22. Keyed address takes seven words. Cash with order necessary on "Positions Wanted" advertisements. Replies forwarded without charge. Displayed classified rates on request. Address your copy and instructions to STEEL, Penton Building, Cleveland 13, Ohio.

NEW from UDYLITE
UDYSIL
THE SILICON RECTIFIER with BALANCED POWER


REMOVABLE CONTROL PANEL
Can be mounted on the rectifier . . . or anywhere in the shop!
SILICON CELL
Hermetically sealed . . . cells can't "age"!
MAIN TRANSFORMER
Designed to give uniform output to each cell!
CELL ASSEMBLY
Allows the utmost in cooling . . . 6 cells per 1,000 amps of rating!

EFFICIENCY . . . FLEXIBILITY
THE LONGEST LIFE EVER!

You get all three advantages, and more, with a UDYSIL rectifier! Silicon, the amazing long life element, combined with a new, revolutionary BALANCED circuit, makes the UDYSIL Line the most advanced plating rectifier series ever developed. Only UDYSIL gives you . . .

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All these exclusive advantages are yours when you select a UDYSIL rectifier.

Available in 1,000, 2,000, 3,000, 4,000, 5,000 and 6,000 ampere ratings with a wide selection of voltages, Udysil rectifiers represent the ultimate in performance, long life and dependability. For the "inside" story on the UDYSIL Line and what it can do for you, contact your local UDYLITE representative today, or write direct to:

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production has been reduced to 50 per cent, and consumption of raw materials is consequently less, with inventories high. Japanese melters will need no additional cast iron until next year.

Semifinished Steel . . .

Semifinished Prices, Page 145

The national steel rate of 47.5 per cent of rated capacity does have a bright side: The downturn in production appears to be bottoming out. At least the rate of decline has slowed down noticeably. Last week the rate was off only ½ point for the third successive week, following two weeks of 2-point drops. It is believed that the worst may be over.

The national situation continues to be spotty. At Pittsburgh, Crucible Steel Co. of America has announced it will bank its No. 1 blast furnace and close its open hearth department at the Midland, Pa., Works for a time to permit orders to accumulate. Other departments at Midland will continue to operate.

At Detroit, the word is that Great Lakes Steel Corp. (subsidiary of National Steel Corp.) will resume production this week. Ford is expected to start up some of its idle furnaces May 5. Detroit district operations last week were down to 13 per cent of ingot capacity.

Warehouse . . .

Warehouse Prices, Page 150

Demand for steel products used in construction has improved gradually during the last few weeks but not enough to counteract the poor sales showing in other products. Distributors expect a disappointing second quarter. Their stocks are well-balanced and their orders on mills through midyear will be light.

Producers are taking orders for smaller tonnages than usual, depriving warehouses of part of their bookings, notably carbon bars and buttweld pipe.

In the Houston district, supply of merchant bars is still tight because of extended rolling schedules at mills. The major mill in the area has resumed production, however, and the situation is expected to ease soon.

Demand for plate material from tank builders and makers of pipe is heavier.

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TO FIND THE MAN YOU NEED . . .

Place an advertisement in the "Help Wanted" columns of STEEL's classified pages. Your advertisement will reach the qualified men you need, because STEEL is addressed to highly-trained men in all phases of metalworking

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ONE OF THE NATION'S
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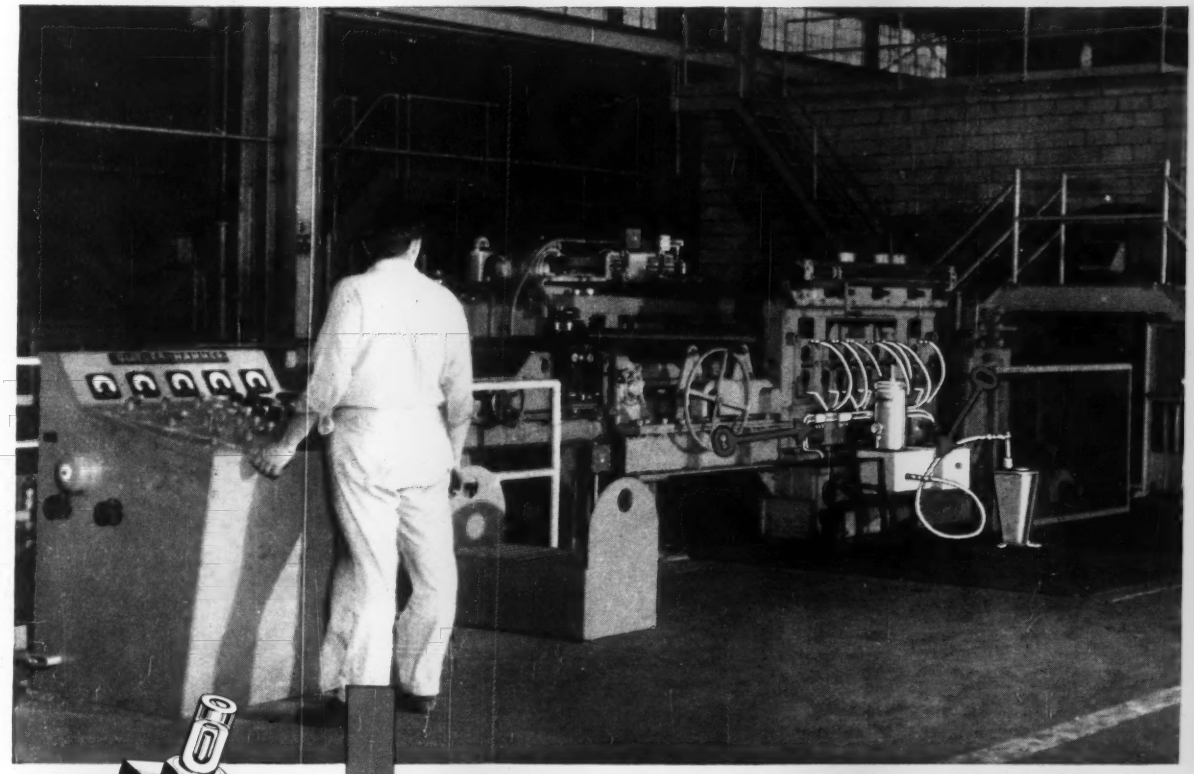
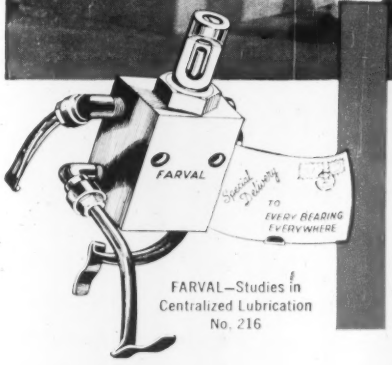




FARVAL—Studies in Centralized Lubrication No. 216

Farval provides automatic lubrication for shearing line at Kaiser-Fontana

Modern, automatic steel mill machinery calls for lubrication systems equally automatic. Farval provides exactly this on an Aetna shearing line in Kaiser Steel's hot strip and tinplate mills at Fontana, California.

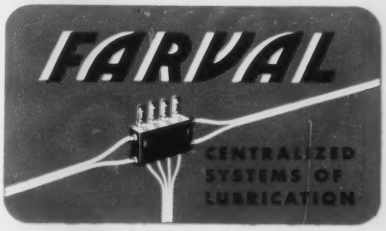
By automatically delivering measured amounts of lubrication to bearings at proper intervals, Farval prevents wear, overheated, ruined bearings . . . eliminates work stoppages, lost production, needless maintenance.

To assure dependable, adequate lubrication of your equipment make sure Farval is on the job. For full details, write for revised Bulletin 26-S. The Farval Corporation, 3270 East 80th Street, Cleveland 4, Ohio.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.

KEYS TO ADEQUATE LUBRICATION

Wherever you see the sign of Farval—familiar valve manifolds, dual lubricant lines and central pumping station—you know steel mill equipment is being properly lubricated.



Precision Shearing at High Speeds... Creative Engineering at Work

As the art of steel making progressed, the continuous high speed line process of manufacturing became an integral part of modern steel production. This advancement in technique brought about the development of precision components that could produce quality at high speeds. The Hallden Shear, designed to shear strip and sheet, is such a tool. The Hallden Flying Shear has been incorporated into 28 coil galvanizing lines, and the Hallden Rotary Tin Plate Shear is operating in 76 black plate or tin plate lines.
The Hallden Shear, engineered into a great many of Wean's continuous high speed lines, is furnished to the steel industry by The Wean Engineering Company Inc., Warren, Ohio.

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